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ABSTRACT

This report examines whether educationally disadvantaged or at-risk preschool children have access to center-based early childhood programs similar to the access enjoyed by advantaged children, and whether the programs are of comparable quality. Eight risk factors that represent gross indications of educational disadvantage are examined, including low income, single parent household, primary language other than English, and a disabling condition. The first part of the report focuses on access to center-based programs. It looks at the association between each risk factor and enrollment. The second part of the report addresses the issue of the quality of programs in which children are enrolled, specifically the extent to which their average group sizes and ratio of children to staff met both state and professional standards. The report concludes that some at-risk children have better access to early childhood programs than other at-risk children, and that the risk factors associated with lower enrollment include low household income, being a child of a poorly educated mother or a mother who was a teenager when she first became pregnant, and living in a large household. With regard to access to programs of similar quality, the report notes that the quality of programs enrolling children from low income families did not differ from that of programs enrolling children from higher income families. Black children were less likely than white children to be enrolled in programs that met state standards, but more likely to be enrolled in programs that met professional standards. Three appendixes provide results of a methodological study comparing the reports from parents with those of their children's care providers. Contains 55 references. (HTH)

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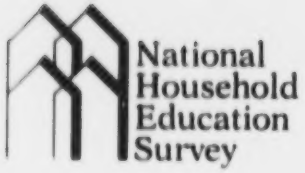

Access to Early Childhood Programs for Children at Risk

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May 1994

Executive Summary

The first National Education Goal states, "By the year 2000, all children will start school ready to learn." In expressing this goal, emphasis was placed on the role that children's early experience plays in preparing them for successful schooling. Thus, the first objective associated with this goal states that all disadvantaged and disabled children will have access to high quality and developmentally appropriate preschool programs that help prepare them for school. This report addresses two issues raised by this objective: First, do educationally disadvantaged or "at-risk" children have similar access to early childhood programs as children who are not at-risk? Second, do educationally at-risk children have access to the same quality of early childhood programs as children who are not at-risk?

This report first examines the center-based early childhood program enrollments of preschool children who are educationally disadvantaged. Center-based early childhood programs include day care centers, nursery schools, and other types of organized group programs such as prekindergarten and Head Start. Care and education children receive from relatives and nonrelatives in their own homes or in the private homes of others is not examined in this report. Eight risk factors, which represent gross indicators of educational disadvantage are examined, as well as a total risk factor score obtained by summing the separate risks. The eight risk factors are: living in a household whose income is low, being a member of a minority racial-ethnic group, living in a home where the primary language spoken is not English, living with one parent, living in a large household, having a disabling condition, having a mother who has not completed high school, and having a mother who first became a parent as a teenager. These characteristics have often been found to be associated with poor educational outcomes, and children who have one or more are often considered to be "at risk" of school failure. While not every child with any one of these characteristics will fail in school, on average, children with one or more of these risk factors are expected to have lower levels of achievement than those without any risk factors. Fifty-nine percent of preschool children had at least one risk factor.

Access to programs was defined in terms of the extent to which educationally disadvantaged children utilize these programs at levels approximating the national average for other children of comparable age and characteristics. Access and utilization are not identical, since utilization may be affected by such factors as awareness, convenience, cost, availability of spaces, program characteristics, and preferences.

If disadvantaged children are enrolled in center-based early childhood programs at levels similar to those of advantaged children but the quality of these programs is poor, then the first objective under Goal One has not been achieved. Thus the second objective of this report was to examine the quality of programs in which at-risk and not-at-risk children are enrolled. Quality is defined in terms of the extent to which children's programs meet state and professional standards for group size and child/staff ratios.[1]

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[1]The professional standards used are those recommended by the National Association for the Education of Young Children (NAEYC), a professional association of early childhood educators.

This report uses data from the National Household Education Survey (NHES:91) provided by the parents and guardians of 5,091 children who were between the ages of 3 and 5 years old on January 1, 1991 and who were not yet enrolled in kindergarten. Information on state regulations was collected for the Profile of Child Care Settings Study and the National Child Care Survey 1990, supplemented by information from a 1990 state survey conducted by Gwen Morgan of Wheelock College.

The approach taken in this report was, first, to examine the relationship between each risk factor and enrollment separately. For example, the report examines enrollment in center-based early childhood programs by the income of the household. Second, since there are other differences among children and their families that might affect enrollments (e.g., the child's age, mother's employment status), we examined the relationship between each risk factor and children's enrollment after adjusting for these differences. Unless otherwise stated, the results reported in this summary are based upon the adjusted findings.[2]

Do At-risk Children have Equal Access to Early Childhood Programs?

The answer to this first question is a qualified no; it depends upon the measure of risk. Some at-risk groups have more and others less access, measured by their level of utilization. Thus the overall risk factor index was only weakly related to lower enrollment. Once adjusted for other factors, several commonly used measures of risk were found to be associated with lower enrollment in center-based programs. These include low household income, being a child of a poorly-educated mother or a mother who was a teenager when she first became a parent, and living in a large household. Specifically, the findings suggest that:

- Children aged 3-4 in low-income and lower-middle-income households were less likely than 3- and 4-year-olds in upper-middle to high-income households to be enrolled in a center-based program. There was no difference in enrollments between children from low-income and lower-middle-income households.[3]

- Compared to mothers with only a high school diploma or GED, preschool children of mothers without a high school diploma or GED were less likely to attend a center-based program; preschool children of mothers who had attended or graduated from college were more likely to attend a center-based program.

- Preschool children born to a mother who first became a parent as a teenager were less likely to be enrolled in a center-based program than preschool children whose mothers were 20 years old or older when they first became a parent.

---

[2]The results are based upon odds ratios adjusted for income, race-ethnicity, age of child, region, urbanicity, mother's presence in the home, and mother's employment status.

[3]By low-income we mean households with annual incomes of $15,000 or less. By lower-middle income we mean households with annual incomes of $15,001 to $30,000. By upper-middle to high-income we mean households with annual incomes of $30,001 or more.

- Preschool children in households with four or more members were less likely to be enrolled in a center-based program than preschool children in households with 2 or 3 members. The more members, the stronger the effect.

Two risk factors were not found to be associated with lower enrollment—living with only one parent, and having a disability. In fact, children with disabilities were more likely than children without disabilities to be enrolled in a center-based program. This is consistent with efforts to identify such children early and mandates to serve those so identified.

- Preschool children who had a disabling condition were more likely to be enrolled in a center-based program than children who did not have such a condition.

Speaking a language other than English in the home was at first found to be associated with lower enrollment in center-based programs. However, this relationship appears to be a result of other differences between such families, since it was no longer found when income, race-ethnicity, urbanicity, region, age of child, maternal employment, and presence of the mother, were controlled.

Minority race–ethnicity was not consistently associated with lower enrollment in center-based programs. Hispanic children were the only ethnic group found to have lower enrollment in a center-based program than white children, after adjusting for a variety of factors. However, this was apparently due to the lower educational levels of Hispanic mothers, since the difference was not observed once maternal education was controlled.

Controlling for other factors, black children were more likely to be enrolled than white children. This finding was not evident when examining the enrollment rates for children from different racial-ethnic groups, but emerged once household income was taken into account.

- Black children were more likely to be enrolled in center-based early childhood programs than white children, all else being equal.

The difference between the relationship of race–ethnicity to enrollment and that of other factors, such as maternal education, must be emphasized. Through subsidies, public and private agencies can redress enrollment differences between disadvantaged groups, and the results of this study are consistent with public efforts to reduce discrepancies by race–ethnicity and disability status. Black children were actually more likely to be enrolled than white children once other differences between blacks and whites were taken into account. This is not the case for the relationship between education of the mother and center-based program enrollment. Differences between children of more- and less-educated mothers remained even after controlling for employment status and other differences. This suggests that removing barriers to access per se will not eliminate differences in use of center-based programs. *Educating parents about the benefits of such programs is important.*

Although we continue to find differences in enrollment by income after controlling for a variety of other factors, the fact that enrollments do not differ among children from low-income and lower-middle income households, and the fact that black children and disabled children are more likely to be enrolled than white and nondisabled children, are consistent with public policy

efforts to target assistance to such children. Hispanic children are clearly an important target for public policy attention since their enrollment is low relative to that of white children.

Do At-Risk Children have Access to Similar Quality Programs?

On the question of whether disadvantaged children have access to programs of similar quality, the answer is still that we do not know. Based upon whether the child/staff ratio of the child's program meets state and professional standards, only when the analysis failed to take into account other differences between children that are related to enrollment did the findings support other studies that have found quality to be somewhat lower for middle-income than for high-income children. Once other differences between these children were controlled, no significant income differences in enrollment in programs that met state or professional standards for child/staff ratio were found. This suggests that, on this measure, at least, low income children's program quality does not differ from that of high-income children.

- There were no significant income differences in whether children were enrolled in programs that met state or professional standards for child/staff ratio and group size.

Black children were less likely than white children to be enrolled in programs that met state standards, but more likely to be enrolled in programs that met professional standards. The range of state standards is great, with some states requiring considerably fewer children per staff than recommended by professionals. Black children may have greater access to Head Start and state-funded, center-based programs that are exempt from state licensing standards but which are subject to oversight by school systems or national organizations, including the federal government.

- Black children were more likely to be enrolled in center-based programs meeting professional standards for child/staff ratio than white children.

- Black children were less likely to be enrolled in center-based programs meeting state standards for child/staff ratio than white children.

This attempt to evaluate program quality used parent reports to analyze the relationship between characteristics of children and their families and characteristics of the programs in which they are enrolled. Parents are not perfect reporters of this information, and such reports are measured with error. In addition, the amount of variation in quality is small according to the measures used here: child/staff ratio and group size. The nature of the NHES, a telephone study of parents, limits the ability to examine the issue of access to quality center-based programs. Clearly, better measurement of quality and more information obtained directly from providers are needed before strong conclusions can be drawn about differences in the quality of programs in which different groups are enrolled.

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I. Introduction

The first National Education Goal states, "By the year 2000, all children will start school ready to learn." In expressing this goal, the governors emphasized the role that children's early experiences play in preparing them for successful schooling. Thus, the first objective associated with this goal states that all disadvantaged and disabled children will have access to high quality and developmentally appropriate preschool programs that help prepare them for school. This report addresses two issues: First, do educationally disadvantaged or "at-risk" children have similar access to early childhood programs as do children who are not at-risk? Second, do educationally at-risk children have access to the same quality of early childhood programs as children who are not at-risk?

Why Focus on Access?

Increased Population of Educationally Disadvantaged Students

Children who have had inappropriate educational experiences at home, in school, or in the community are at greater risk of performing poorly in school, dropping out of school, and having difficulty making the transition to adulthood (Pallas et al. 1989). Since the early 1970s, the population of these educationally disadvantaged children has increased, reflecting markedly changed realities of work and family life, such as increasing divorce, teenage and out-of-wedlock childbearing, and declining job opportunities and real wages for young people (Zill 1992c). Today, of the 4 million babies born each year, nearly 1 out of 8 is born to a teenage mother, 1 out of 4 to a mother with less than a high school education, almost 1 out of 4 to a mother who lives in poverty, 1 out of 4 to an unmarried mother, and 1 in 14 is born with low birth weight (Zill 1992b). These conditions have been shown to be associated with a child experiencing problems such as repeating a grade, requiring special education services, being suspended, and dropping out of school (Zill 1992a,b). As a consequence of societal changes, more than 1 out of 3 preschool children were at risk of school failure in the late 1980s (Pallas et al. 1989). Continued immigration may increase the proportion of the population at risk of school failure because many immigrants of Hispanic origins, who comprise a large proportion of immigrants today, tend to be younger, to be less educated than earlier immigrants of European descent, and to have higher birth rates (Edmonston and Passel 1991; Meisenheimer 1992).

Early Childhood Programs Moderate the Effects of Disadvantage

While the growing numbers of children who are educationally disadvantaged is of concern, research has found that high-quality center-based early childhood programs can help mediate certain of the effects of being disadvantaged. Although initial IQ and achievement test gains fade by about the third grade, a systematic comparison of the results of 22 studies demonstrated that participation in high-quality early childhood education and care programs has long-term positive effects on low-income minority children's school completion (Barnett 1992). Of the effects, the best documented are reductions in special education enrollment and grade retention (Barnett 1992). Declines in grade retention are associated with completing high school

(Barnett 1992). A recent comparison at age 27 of participants and controls from the Perry Preschool Project, a high-quality center-based program, shows significantly higher earnings, home ownership, schooling completed, a lower percentage receiving social services, and significantly fewer arrests among participants than among controls (Schweinhart and Weikart 1993). The long term benefits of high-quality preschool programs for participants, their families, and their communities are documented (Barnett 1992).

Low-Income Children Less Likely to be Enrolled

Recent data suggest, however, that disadvantaged children are not as likely as other children to be enrolled in center-based early childhood programs. According to the Current Population Survey (CPS), 34 percent of all 3- and 4-year-old children were enrolled in *nursery school* in 1991; however, only 23 percent of children from families with incomes under $10,000 were enrolled, compared with 54 percent of children from families with annual incomes above $50,000 (Kaufman forthcoming).[1] The Head Start program has substantially increased the proportion of low-income children enrolled in center-based programs; however, it still serves fewer than one-half (40 percent) of eligible 4-year-olds, and fewer than 20 percent of eligible 3-year-olds (Stewart 1993). When *nursery school, Head Start, and other center-based programs* are considered together, the income differential is smaller. In 1990, 60 percent of 4-year-old children whose family incomes were under $15,000 were enrolled in center-based programs, compared with 70 to 79 percent of children in families with annual incomes of $35,000 or more (Hofferth 1993). Children in families with incomes of $15,000 to $25,000 or $25,000 to $35,000 were *less* likely to be enrolled (43 and 52 percent, respectively) than those in low- or high-income families. Thus lower-middle income, rather than low-income, families may have the least access to programs.

Varieties of Early Childhood Education and Care Arrangements

Children are more likely to be enrolled in a variety of early childhood education and care arrangements today than in the past because their mothers are more apt to be working. Between 1970 and 1991, the proportion of children under age 6 with married mothers in the work force increased from 30 to 60 percent (U.S. Bureau of the Census 1992). By 1990 over one-half of American children under age 5 were regularly in the care of someone other than their parents (Hofferth et al. 1991). Very young children are less likely than older preschool children to be enrolled in such programs because mothers with very young children are less likely to be employed than mothers with older children. Even so, mothers today move back rather quickly into the labor force after childbirth; by one year, over half are working (O'Connell 1990). After the first year, increases in labor force participation are gradual. In 1991, 55 percent of mothers with children under 3 were in the work force, compared with 64 percent of mothers with children age 3 to 5. The amount of time per week mothers need child care has also increased. Among all mothers, the proportion employed full-time has risen from 26 percent in 1970 to 46 percent in 1992, while the proportion employed part-time has increased only from 14 to 16 percent (Bureau of Labor Statistics 1992).

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[1]Low income was defined as family income below $10,000, while high income was defined as family income above $50,000.

Programs that care for children in a nonresidential group setting for all or part of the day, often called nursery schools, preschools, or child care centers, are the fastest growing forms of care today (Willer et al. 1991). Such center-based programs may be freestanding, located in a church or school building, or on the grounds of a business. They may be sponsored by churches, schools, public agencies, or owned or franchised by a company that runs a chain of centers. They may be part-day or full-day. Legally, they may be run as for-profit businesses or as not-for-profit organizations.

Data from the 1988 Survey of Income and Program Participation conducted by the U.S. Bureau of the Census (O'Connell and Bachu 1992) and from the 1990 National Child Care Survey conducted by the Urban Institute (Hofferth et al. 1991) provide a picture of the early education and care arrangements of preschool children. One-quarter (26–27 percent) of children under age 5 with an employed mother were enrolled in a child care center as their primary arrangement,[2] compared with 6 percent in 1965, a fourfold increase (Hofferth et al. 1991). Of course, enrollment is dependent on the age of the child, with older preschool-age children much more likely to be enrolled than younger children. More than one out of three (34–37 percent) children age 3–4 of employed mothers were enrolled in a center-based program compared with one out of five (20–21 percent) children age 1–2 and one out of six (14–18 percent) children under age 1 (O'Connell and Bachu 1992; Hofferth et al. 1991).

Still, the majority of children of employed mothers were cared for in a home-based setting as their primary arrangement, including those who were cared for by a parent or another relative while the mother worked, though this proportion has been declining. Fewer than half (44–47 percent) were cared for by a relative or parent, a decline from 62 percent in 1965 (O'Connell and Bachu 1992; Hofferth et al. 1991).

One-fifth to one-fourth (20–24 percent) of children under age 5 with an employed mother were cared for in the home of a nonrelated caregiver, known as family day care or family child care (O'Connell and Bachu 1992; Hofferth et al. 1991). Such providers may be licensed and regulated (10 to 18 percent) or nonregulated (80 percent) (Willer et al. 1991). The proportion of children in family day care has remained stable since the mid-1970s (Willer et al. 1991).

In contrast, there has been a sharp decline in the proportion of children of employed mothers cared for by a nonrelative or sitter in the child's home as the primary arrangement, from 15 percent in 1965 to 4–5 percent in 1990 (O'Connell and Bachu, 1992; Hofferth et al, 1991).

Another major shift in children's care was brought about by the increased enrollment of children in early childhood programs for educational reasons. According to Census Bureau data based upon the October Current Population Survey (CPS), in 1991 over one-half (53 percent) of all 4-year-old children were enrolled in a nursery school or prekindergarten program, compared with only 28 percent in 1970. Similarly, 28 percent of 3-year-olds were enrolled in 1991, compared with 13 percent in 1970 (Kaufman et al. forthcoming). Differences in enrollment by the employment status of the mother are small. Thirty percent of the 3-4-year-old children of nonemployed mothers were enrolled in a center-based program as their primary arrangement in

[2]The *primary* arrangement is the one that lasts the most hours.

1990, compared with 37 percent of the 3-4-year-old children of employed mothers, though most of the former were only enrolled on a part-day basis (Hofferth et al. 1991). Increasingly, parents expect to enroll their children in such programs as they reach the age of 3 or 4, representing preferences as well as need for child care (Hofferth et al. 1991). Such enrollments may not be captured as well in surveys that interview only employed mothers about child care, such as in the Census Bureau's Survey of Income and Program Participation (O'Connell and Bachu, 1992).

While nursery school enrollment data based upon the October CPS have been widely used to estimate program participation among all children because all parents are interviewed, these data do not describe total enrollments of children in early childhood programs more generally because some types of programs are excluded. In particular, the data collection was designed to exclude programs without an explicit educational component. Thus, the CPS includes only nursery school or center-based programs, defined as "a group or class that is organized to provide educational experiences during the years preceding kindergarten." According to focus group discussions, however, parents cannot easily distinguish among the variety of center-based programs, and may rely on whether "preschool" or "nursery school" is part of the name to make the distinction (Nolin et al. 1992). The findings of a recent report imply that what distinguishes nursery schools from child care centers may be whether they operate part-day or full-day programs (West et al. 1993). Preschool children of nonemployed or part-time employed mothers who were enrolled in a center-based program were more likely to be enrolled in what their parents called "nursery school." Children of full-time employed mothers were equally likely to be enrolled in what they referred to as "day care centers" and in "nursery schools."

Early childhood experts argue that children learn in a variety of settings and that the distinction between "nursery schools" and "child care centers" based upon their presumed differential emphasis on educational activities is not meaningful (Bredekamp 1987; Phillips 1987). In fact, parents report that most early childhood programs have an educational component. In the 1991 National Household Education Survey, parents were asked about their child's enrollment in a nursery school or prekindergarten program separately from their enrollment in a day care center. When asked whether the program had an educational component, 95 percent of parents whose children were in nursery school reported that the program did, compared with 90 percent of parents of children in a day care center (Brick et al. 1992). Studies that have counted both nursery school and other center-based programs together have estimated that in 1990 as many as 60 percent of 4-year-old children were enrolled in a center-based program (Hofferth 1993), and 71 percent of first and second graders attended a center-based program prior to entering first grade (West et al. 1992). Analyses of early education and care and related early childhood programs in this report comprise enrollments in all types of center-based programs, whether they are known as nursery schools, preschools, or child care centers. While children learn in a variety of settings other than center-based programs, the focus in this report is on the enrollment of preschool children ages 3–5 in center-based programs prior to school entry.

Measuring Educational Risk

This report defines educational risk in terms of a set of characteristics that have often been found to be associated with poor educational outcomes. These include family characteristics such as low income or poverty status, being from a minority racial–ethnic group (black or Hispanic), living in a single-parent family, or living in a large family. Since the primary caretaker

for most children is usually the mother, the characteristics of the mother, such as being poorly educated or having become a parent as a teenager, are also important. Children with a disabling condition and children from a family that speaks a language other than English in the home may be at risk. Pallas et al. (1989) identified between 10 and 25 percent of the U.S. population as having any of these single indicators. Children who have one or more of these characteristics are considered educationally disadvantaged or "at-risk" of school failure (Pallas et al. 1989). Based upon the likelihood of having at least one such risk, the proportion of children under 18 at risk of school failure was estimated to be at least one-third (Pallas et al. 1989). While not every child with any one of these characteristics will do poorly in school, on average, children with one of these risk factors have an increased probability of having lower levels of achievement than children without any risk factors.

Since these characteristics often occur together, children may come from families with more than one of these risk factors (e.g., single parent, poor, minority) (Haffner et al. 1992). Researchers (e.g., Sameroff et al. 1987) have found a linear relationship between a cumulative risk score and verbal IQ scores and social adjustment in 4-year-old children, and concluded that it was the number of risks rather than the particular risk involved that was important.

Measuring Access

For purposes of the analysis, access will be defined in terms of the level of utilization of particular programs (i.e., kindergarten and center-based early childhood programs). Utilization of a program implies access. However, the converse is not necessarily true. Some parents may live near a center-based early education program and, for a variety of reasons, including awareness, convenience, cost, availability of spaces, preferences, and quality of program, not use it. Research has shown that such factors have an influence upon whether a child is enrolled in a program (Hofferth and Wissoker, 1992). Disadvantaged or at-risk children's access to early childhood programs will be measured by the extent to which children utilize these programs at levels approximating the national average for advantaged children of comparable age and characteristics.

Why Focus on Quality of Programs?

Quality of programs must ultimately be defined in terms of characteristics of programs or behavior of providers that improve the development of children. The consensus in the research community is that the quality of the care children receive matters more than the particular type or form of care (Howes 1992; Phillips 1987). Research does not show that outcomes differ by the type of care (e.g., center-based care, family day care). Rather, child care quality and children's outcomes vary within each form of care more than they vary across forms of care (Howes 1992; Phillips 1987). Thus, even if parents enroll their children in center-based early childhood programs, if the quality of these programs is poor, then the first objective under Goal One has not been achieved.

Research has shown three structural characteristics of child care settings to be associated with positive developmental outcomes for children: group size, child/staff ratio, and the education or training of the caregiver (Phillips 1987; Ruopp et al. 1979). The advantage of these

three indicators is that they can be manipulated through public policies such as regulation. Of the three, the child/staff ratio is the indicator most often subject to regulation. All but three states regulate child/staff ratios, whereas fewer than one-half of the states regulate group size (Morgan 1992). Education and training of child care providers are generally regulated, but the extent of regulation varies sharply from state to state.

In addition, while many process aspects of child care quality (e.g., interaction between teacher and child) must be measured by on-site observation and evaluation, measures of structural characteristics can be obtained from providers or even from parents, although there is disagreement as to whether parents can provide valid and reliable estimates of these characteristics. While it is often argued that they cannot, there have heretofore been no systematic comparisons of parent and provider reports of the characteristics of the same program.

The early childhood programs from which researchers have inferred benefits to disadvantaged children were of very high quality. They included a developmentally appropriate learning environment, inservice training, parent involvement, low child/staff ratios, and reliable assessment procedures (Schweinhart and Weikart, 1993). Yet many of the programs in which children are enrolled today are of average quality or worse (Whitebook et al. 1989). Children cannot be expected to reap the same benefits from programs that are average in quality as they do from those of high quality. In fact, the quality dimension of child care has the most consistent relation with child outcomes. According to a recent review, "children enrolled in higher quality care (measured either by process or structure) score higher on concurrent and longitudinal measures of all domains of development than children enrolled in lower quality care" (Howes 1992).

The comparability of the programs attended by disadvantaged and advantaged children is questionable. While one might expect programs serving disadvantaged children to be of poorer quality, such children may, in fact, have access to high quality programs because of the availability of subsidies (Hofferth 1993). In a five-city sample of child care centers, the National Child Care Staffing Study found that the quality of programs, as measured both by either structure or process, was highest for children from the highest and lowest income families, with children from middle income families enrolled in the lowest quality programs (Whitebook et al. 1989). A recent analysis of data from the Profile of Child Care Settings Study found similar results (Phillips et al. 1992).

When examining the quality of center-based early childhood programs in which children are enrolled, this report measures quality in terms of two structural characteristics—group size and child/staff ratio. Data on these characteristics were reported by parents in the National Household Education Survey for each of the center-based programs their children attended. Program quality is determined by whether the programs attended by children met standards established by state regulations or standards recommended by the National Association for the Education of Young Children (NAEYC), an association representing early childhood educators. NAEYC recommends that no more that 20 children aged 3 to 5 be cared for in a group, and that the ratio of children to staff not exceed 10 to 1. State standards, in contrast, vary widely. The maximum group size ranges from 12 to 35 and the maximum child-staff ratio ranges from 7:1 to 25:1 for 3- to 5-year-olds.

Data Sources and Limitations

The National Household Education Survey was designed to gather descriptive data to monitor educational activities of American families and their children that cannot be obtained in a school- or institution-based survey. Households were sampled using random-digit dialing methods and interviews were conducted using computer-assisted telephone interviewing (CATI) techniques.[3] The National Household Education Survey (NHES:91) was conducted for the first time in the spring of 1991. It collected data between February and April of 1991 from a nationally representative sample of the parents of 13,892 children 3–8 years old. The survey obtained information on children's participation in home-based child care and center-based programs prior to first grade as well as other child, parent, and family characteristics. This report uses data provided by the parents and guardians of 5,091 children who were between the ages of 3 and 5 on January 1, 1991 and who were not yet enrolled in kindergarten.

Information on state regulations was collected for the Profile of Child Care Settings Study (PCS) which was funded by the U.S. Department of Education, and the National Child Care Survey of 1990 (NCCS) which was funded by the U.S. Department of Health and Human Services and the National Association for the Education of Young Children (NAEYC). Additional data were obtained from Morgan (1992). The proprietary data file for the NHES:91 contains state codes that were used to identify the appropriate state standards which were then compared with the group sizes and child/staff ratios reported by parents. An important limitation of the analysis in this report is that group size is not regulated in about half of the states; only the analysis of child/staff ratios is based upon children in all the states.

The population to which this study can be generalized is resident U.S. preschool children 3–5 years of age as of January 1, 1991. The reader should, therefore, be cautious in comparing the enrollments obtained in this study to those in which age is determined as of October of the year, such as the Education Supplement to the Current Population Survey. A slightly larger proportion of 5-year-olds will be enrolled in preschool and a smaller proportion of 5-year-olds will be enrolled in kindergarten because some will have turned 5 after the cut-off date for entry.

This study focuses on children prior to school entry, defined as entry into kindergarten. From 97 to 99 percent of 3- and 4-year-olds were represented, since few children are enrolled in kindergarten before age 5. Twenty-eight percent of 5-year-olds were not yet enrolled in school and are therefore considered preschool children in this report.

Organization of the Report

The first part of this report focuses on access to center-based programs. It looks at the association between each of a variety of risk factors and enrollment in center-based programs, first, without adjusting for other factors (e.g., age of the child, mother's employment status) that

[3]If an interviewer contacted a family who preferred to conduct the interview in Spanish, a Spanish speaking interviewer and instrument were used.

are related to enrollment (bivariate analyses) and second, with adjustments for these factors (multivariate analyses).

The second part of this report addresses the issue of the quality of programs in which children are enrolled, that is, the extent to which their average group sizes and child/staff ratios in 1991 met both their state and professional standards.

Average group sizes and number of staff were obtained through parent interviews. There is some concern, however, that parents are not good reporters of this information. If they are not good reporters, then any conclusions we might draw about the quality of programs in which children are enrolled could be called into question. Consequently, we conducted a methodological study that compares the reports of parents with those of the providers of care for their children on these structural aspects of quality. Appendix A addresses the issue of the correspondence between parent and provider reports on characteristics of the child care program in which the child is enrolled. Because it is not central to the main argument of the report, it is not included in the main body. However, in order to use data provided by parents to evaluate the quality of early childhood programs, we must be assured that parents can report such information with reasonable accuracy. Based upon this work, we believe that they can; however, readers can draw their own conclusions based upon this methodological report.

II. Access to Center-Based Early Childhood Programs

Enrollment in Kindergarten

Table 1 shows the enrollment of all children age 3–5 in kindergarten. Three-quarters of 5-year-olds, but very few younger children, are enrolled in kindergarten. In spring 1991, fewer than 4 percent of 4-year-olds and almost no 3-year-olds were enrolled in kindergarten, compared with 72 percent of 5-year-olds (table 1). There were no differences in enrollment in kindergarten among children of various income levels because kindergarten is available and free in most states.[4] Consequently, even though there may be differences in the quality of kindergarten programs, issues of access per se are more important for children who have not yet enrolled in school. Therefore, the remainder of this report focuses on preschoolers, that is, children aged 3–5 who were *not* enrolled in kindergarten.

Table 1—Percentage of children age 3–5 enrolled in kindergarten: 1991

	Age 3	Age 4	Age 5
Percent enrolled	*	3.4	71.6
Number enrolled	--	127,214	2,631,109
Number of children	3,764,659	3,762,909	3,674,728

* Less that .5 percent.
-- Small sample size
NOTE: For additional information, see appendix tables C1a and C3.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Enrollment in Center-Based Early Childhood Programs

By Age of Child

Age is clearly an important factor affecting enrollment in center-based programs. Four- and 5-year-olds are much more likely to be enrolled in such programs than are 3-year-olds. *Forty-two percent of 3-year-olds, 60 percent of 4-year-olds, and 64 percent of 5-year-olds who were not enrolled in kindergarten were enrolled in a center-based program* (table 2).

[4]Some children do not enroll until age 6. Other analyses of the NHES have shown that 98 percent of first and second graders had attended kindergarten (West et al. 1991).

Table 2—Percentage of preschool children enrolled in center-based programs, by age: 1991

	Age 3	Age 4	Age 5
Percent enrolled	42.3	60.4	63.8
Number enrolled	1,585,631	2,196,246	666,364
Number of preschoolers	3,764,891	3,635,695	1,043,619

NOTE: For additional information, see appendix table C1a.

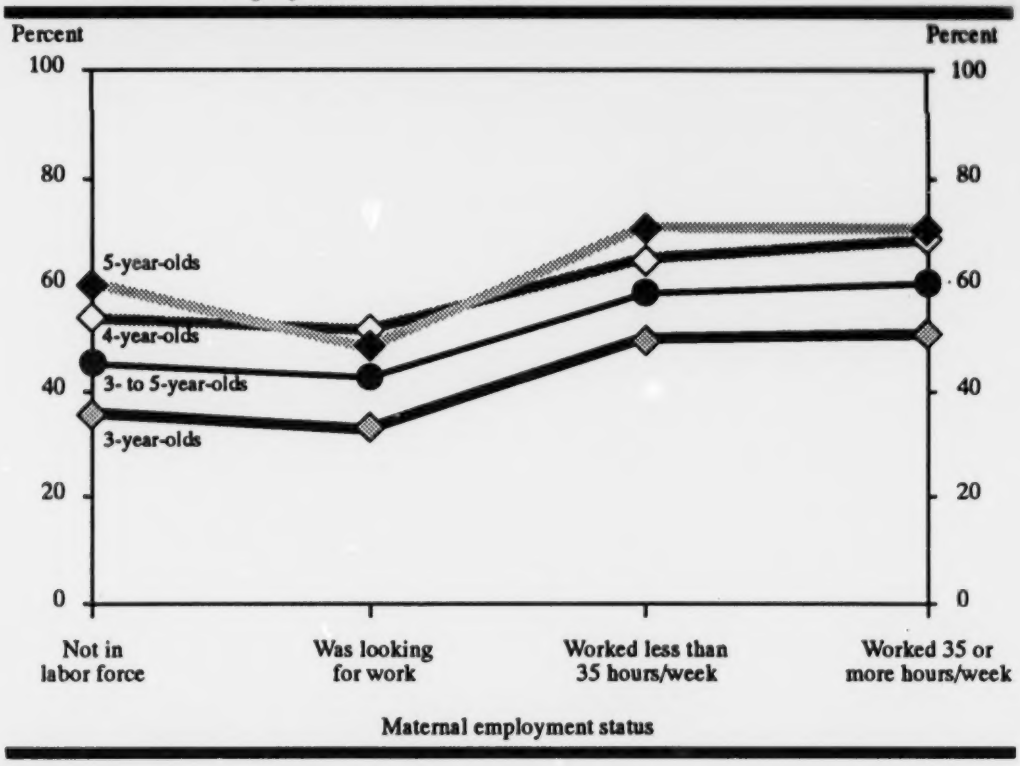
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

By Age and Maternal Employment Status

Research has consistently shown that, after age of the child, maternal employment status is the most important influence on enrollment in center-based early childhood programs, with children of employed mothers more likely to be enrolled in such programs than children of nonemployed mothers (Hofferth et al. 1991; Kaufman forthcoming). Figure 1 shows NHES:91 estimates of the percentage of children enrolled in a center-based program by the employment status of their mother.[5] The levels of enrollment among children of employed and nonemployed mothers differed in the expected manner—*children of employed mothers were more likely to be enrolled in a center-based program than children of nonemployed mothers (59 percent versus 45 percent). However, a substantial proportion of children of nonemployed mothers were also enrolled.* Whether the mother was not in the labor force or was looking for work made little difference in the child's enrollment, and whether the mother worked full time or part time also made no difference in the child's enrollment. While the lack of difference by mothers' work hours is somewhat surprising, it is less surprising for 3- to 5-year-old preschool children than it might be for younger children. West et al. (1993) found that large percentages of preschool children whose mothers were employed part-time attended nursery school programs. The difference in enrollment by maternal employment status was found to be weaker at age 4 than at age 3, and no longer present at age 5. As children approach school age, enrollment in center-based programs becomes less dependent on the employment status of the mother.

[5]For the purposes of this report, "mother" includes stepmothers and female guardians.

Figure 1— Percentage of preschool children enrolled in center-based programs, by age and maternal employment status: 1991



NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

By Age, Maternal Employment, and Controls

Maternal employment is only one variable that may modify the relationship between the age of the child and enrollment in a center-based program. Because there are several such factors that need to be adjusted, this section presents multivariate analyses of the effects of child's age and mother's employment status, controlling for several other variables.

The basic model examines the joint effects of the child's age, whether the child lived with the mother, the mother's employment, and their area of residence (urban versus nonurban area and one of four Census regions) on enrollment in a center-based program. As shown in table 3, preschool enrollment increased with children's age, controlling for other variables. In terms of the adjusted odds ratios, 3-year-olds were 52 percent less likely than 4-year-olds to be enrolled

in a center-based program in 1991.[6] Since a small number of children were not living with their mothers (for these children we do not have information on the mother's employment, education, and age when she became a parent), a dummy variable was used to indicate whether or not the child was living with the mother. *Preschool children not living with their mothers were as likely to be enrolled in a center-based program as children living with their mothers. Among preschool children living with their mothers, those whose mothers were employed outside the home were 44 percent more likely to be enrolled in a center-based program than those whose mothers were not employed.* This is consistent with results not controlling for other variables (e.g., Figure 1).

Table 3—Adjusted odds ratios of enrollment of preschool children in center-based programs, by age, maternal employment, urbanicity, region, and presence of mother: 1991

Variable	Odds ratio
Age 3 v. age 4	0.477***
Age 5 v. age 4	1.233
Mother employed v. not employed	1.443***
Urban v. non-urban	1.423***
Northeast v. South	1.112
Central v. South	0.932
West v. South	0.825*
No mother in household v. mother in household	0.673

*p<.05.
***p<.001.
NOTE: Odds ratios after controlling for other variables in the table.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Other research has found more centers in the South relative to the eligible population (e.g., Kisker et al. 1991) and higher rates of enrollment among children living there (Hofferth et al. 1991). Urban residents are also more likely to be enrolled in center-based programs than nonurban residents (Hofferth et al. 1991). Region and urbanicity were included to control for differences in the cost and supply of programs across the United States. Here a child was said

[6]Calculated as (Odds ratio-1)*100). This represents the percent increase (or decrease) in the adjusted odds of enrolling in a preschool program associated with the category of interest relative to the comparison category (see Appendix B for a more complete description of odds ratios and their calculation).

to reside in an urban area if the area in which he lived included a city of at least 50,000 or an urbanized area of at least 50,000 with a total metropolitan population of at least 100,000 (See appendix B for definitions of all variables used in the analysis).

In multivariate models using the NHES:91, *children living in urban areas were 42 percent more likely than children living in nonurban areas to be enrolled in a center-based program, in terms of the adjusted odds ratios. Enrollment in center-based programs was 17 percent lower for children living in the West than in the South.* But there were no differences in enrollments between children living in the South and in other regions of the country.

Description of Risk Factors

This research examined the relationship between the following risk factors and enrollment: household income below poverty line; being black or Hispanic; English not being spoken in the home; having only one parent in the home; large family size (6 or more members); living with a mother who has less than a high school education or who became a parent before age 18; and having a disability reported by parent. The proportion of children living in families with any one of these characteristics ranged from only about 5 percent (having a disabling condition) to 27 percent (being from a minority racial–ethnic group) (table 4).

A risk index was created by summing the number of risks reported for the child. The possible scores ranged from 0 to 8, and the actual scores ranged from 0 to 7. According to this measure, 41 percent of the children had no risks, 25 percent had one, 16 percent had two, 9 percent had three, and 9 percent had four or more (table 5). That 59 percent of preschool children had at least one risk of educational disadvantage represents a much larger incidence of educational risk or disadvantage than is suggested by using any one single indicator (maximum of 27 percent) and a much larger incidence than suggested by previous research (10 to 25 percent, based upon a single indicator, Pallas et al. 1989). However, it is consistent with data from NAEP reading tests that indicate that about 35–40 percent of students are reading below grade level (National Assessment of Educational Progress 1985), since the proportion of children at risk should exceed the proportion who read poorly. Based upon data from the National Education Longitudinal Survey of 1988, Haffner et al. (1992) found that 47 percent of eighth graders had one or more risk factors. The factors used to define educational risk in this latter study were living in a single parent family, low parental education and income, limited-English proficiency, having a brother or sister who dropped out of school, and being at home alone without adult supervision for a long period on weekdays.

Table 4— Percentage of preschool children whose parents reported the presence of various risk factors: 1991

	Poverty	Black or Hispanic	Non-English language	Single-parent household	House-hold size	Educa-tion of mother	Young teenage mother	Dis-abling condition
Total	25.2	27.1	7.1	22.5	15.7	14.5	10.2	4.5
standard error	0.45	0.43	0.36	0.64	0.71	0.68	0.49	0.30
n	6,900	6,900	6,707	6,898	6,900	6,720	6,720	6,900

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

While risk factors are useful for describing the population, they may reflect tastes and preferences in addition to barriers such as lack of information and lack of access to programs. Research suggests that the age trends in enrollments shown in table 2 reflect parents' desires to enroll their children in educational and group programs as their children become older (Hofferth et al. 1991). Consequently, differences in enrollment by risk factor among 4- and 5-year-olds are more likely to be due to barriers of access and cost and less likely to be due to preferences than are differences in enrollment among 3-year-olds. Consequently, we expect that the effects of various risk factors on enrollment may differ for the three age groups of children, with stronger effects on 4- and 5-year-olds than on 3-year-olds, whose enrollment will be a function of (unmeasured) parental preferences as well. Differences in enrollment will first be examined separately by risk factor for each age group as well as for 3–5-year-olds together. We did not conduct separate regressions, however, for 3, 4 and 5-year-olds because our tabulations did not indicate that such differences existed. Rather, we analyzed all 3–5-year-olds together, with controls for whether the child was age 3 or 5, compared with age 4.

Table 5—Percentage distribution of preschool children by number of risk factors reported by their parents: 1991

	Number of risk factors				
	None	One	Two	Three	Four or more
Total	40.9	25.0	15.5	9.4	9.3
standard error	0.58	0.57	0.59	0.54	0.48
n	6,900	6,900	6,900	6,900	6,900

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

In the remainder of this section, the simple association between each risk factor and enrollment is presented, followed by the association between each risk factor and enrollment with

simultaneous controls for several variables. Because of the importance of household income/poverty and race–ethnicity, these two characteristics of children and their families are first discussed separately and then jointly, controlling for other variables.

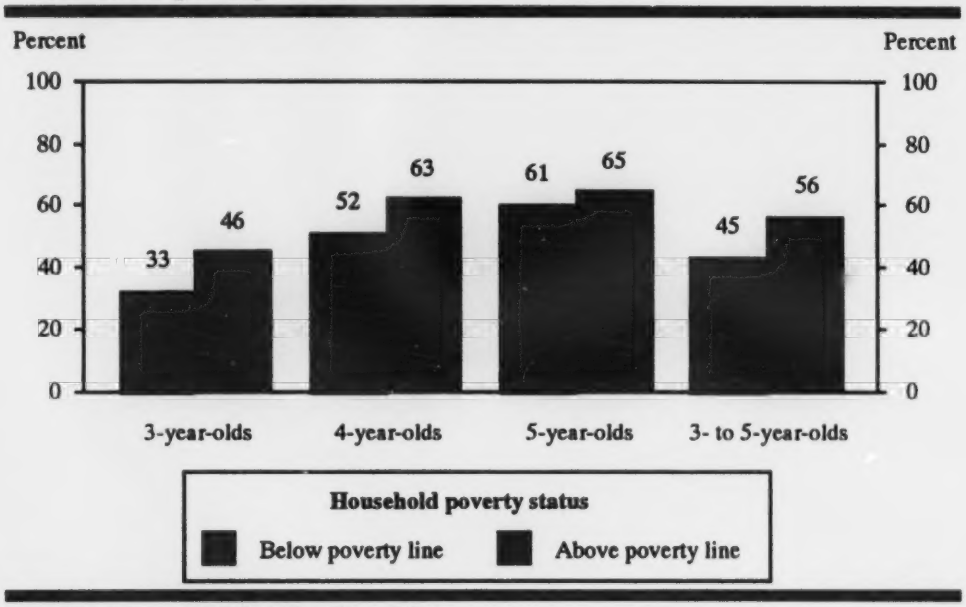
Poverty Status and Income

A substantial amount of research has shown that low income is a major factor placing children at risk of educational failure. Poor children are at risk of inadequate prenatal care, nutrition, health care, and family support (U.S. Department of Health and Human Services 1993). Their families often lack the resources to purchase the basic necessities of life, let alone toys and books to stimulate their children's development. They may be anxious and worried, their lives may be unstable and disorganized. Housing may be a problem. They may live in neighborhoods where violence and drug-dealing are common. Thus, it has been found that the likelihood of poor school performance, being retained in school, and dropping out are much greater for children from low-income families than from families with more economic resources (Bianchi 1984; Kaufman et al. 1992). Compensatory education programs such as Head Start have been available to low-income families at no charge since the late 1960s, though, as of 1990, Head Start still served only about one-third of eligible children (Stewart 1993). Of course, a variety of programs other than Head Start serve low-income families (Goodman and Brady 1988). Still, recent research suggests that low-income children remain less likely to be enrolled in center-based programs than high-income children (Hofferth et al. 1991).

Poverty

In 1991 the poverty line was $13,942 for a family of four. About 45 percent of preschool children in families with incomes below the poverty line were enrolled in a center-based program compared with 56 percent of preschool children in families with incomes above the poverty line (figure 2). Three-and 4-year-olds in families with incomes above the poverty line were more likely to be enrolled in a center-based program than were children from families with incomes below the poverty line; however, by age 5, children from non-poor families were neither more nor less likely to be enrolled than are children from poor families. A dichotomous measure of income, however, masks some interesting relationships that are only evident when looking at more detailed income categories. Attention is focused, therefore, on the continuous measure of income.

Figure 2— Percentage of preschool children enrolled in center-based programs, by age and household poverty status: 1991



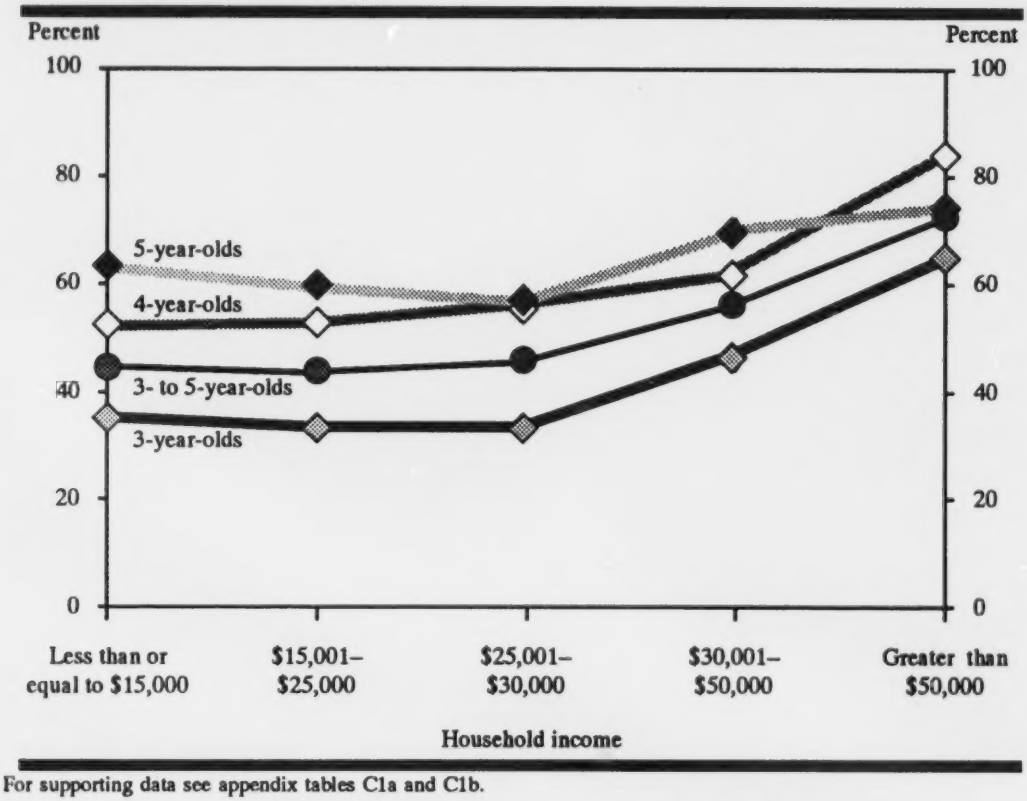
NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Household Income

As with poverty status, there are major differences in enrollment by income. *For all preschoolers, children in households with annual incomes under $30,000 are less likely than children in households with incomes of $30,000 or over to be enrolled in a center-based program.* In 1991, almost three-quarters of 3–5-year-old children in households with incomes of more than $50,000 were enrolled in center-based programs, compared with 45-46 percent of children in households with incomes below $30,000. Two-thirds (64 percent) of 3-year-old children in households with incomes of more than $50,000 were enrolled in a center-based program, almost twice the proportion of children in households with incomes below $30,000 (33 to 34 percent) (figure 3). More than four out of five 4-year-old children in households with incomes of more than $50,000 were enrolled in center-based programs, compared with one-half of children in households with incomes below $30,000. The difference between children in low- and high-income households is not statistically significant for 5-year-old preschoolers, primarily because the sample sizes are small.

Figure 3— Percentage of preschool children enrolled in center-based programs, by age and household income : 1991



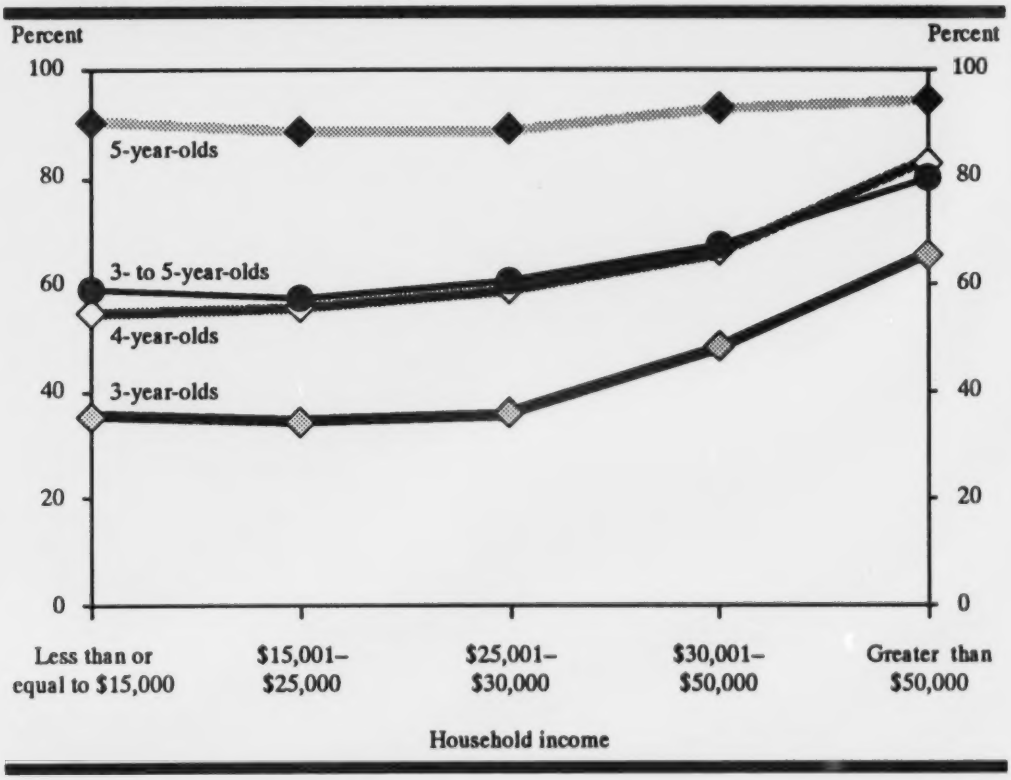
NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

There are no enrollment differences among children in families with annual incomes equal to or less than $30,000 (figure 3). That is, preschool children in households with incomes of $15,000 or less are just as likely to be enrolled in center-based programs as children in households with incomes of $15,000 to $25,000 or $25,000 to $30,000 a year. Just under one-half (45 percent) were enrolled in a center-based program in 1991.

Enrollment in kindergarten is an equalizing force. The effectiveness of kindergarten in equalizing access to programs before first grade can be demonstrated for the moment by examining program enrollment among all children, *including* enrollment in kindergarten (Figure 4). The enrollment of 3- and 4-year-olds in figure 4 does not differ from the earlier figure (figure 3), since few are in kindergarten. Differences in enrollment between children from high and low income households are as discussed above. However, in 1991, 9 out of 10 5-year-olds were enrolled in a program (72 percent in kindergarten and 18 percent in preschool) and there was no difference between income groups (figure 4). Future research should focus on the characteristics of 5-year-olds in different types of programs.

Figure 4— Percentage of children enrolled in center-based programs or kindergarten, by age and household income: 1991



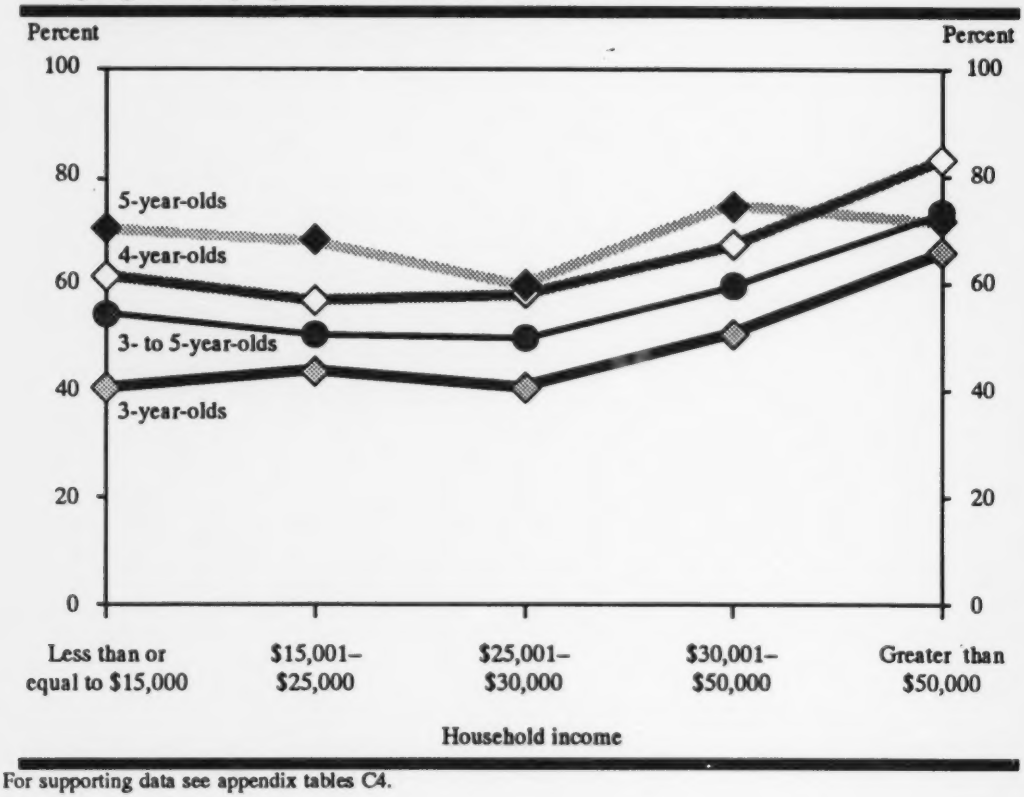
NOTE: For supporting data see appendix tables C2.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Maternal Employment Status and Income

Since mothers who are employed contribute to the income of the household, it is possible that differences by income reflect differences in the employment status of the mother and her need for child care rather than differences by income per se. West et al. (1993) found that children of mothers who were not employed were enrolled in programs that generally operate on a part-day schedule ("nursery school"); few called their program a day care center. In contrast, children of mothers who were employed were enrolled in programs that offered either part- or full-day schedules, depending on their mothers' employment schedule. Figures 5 and 6 show the relationship between income and enrollment of preschool children separately for employed (figure 5) and nonemployed mothers (figure 6).

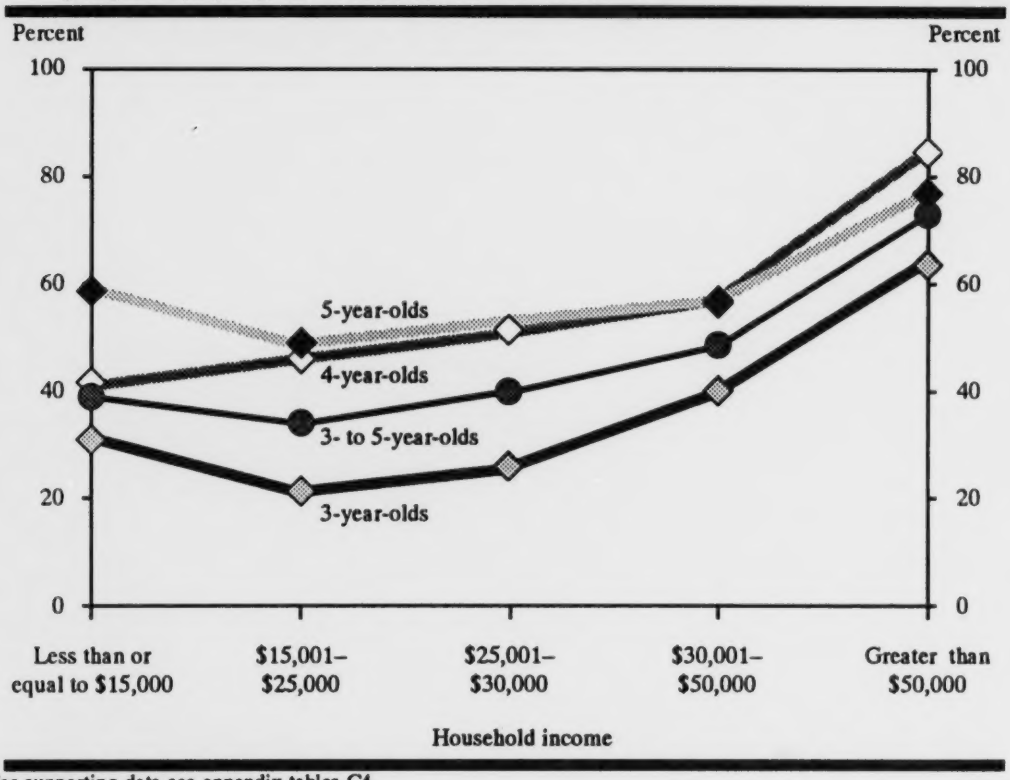
Figure 5— Percentage of preschool children with employed mothers enrolled in center-based programs, by age and household income: 1991



NOTE: For supporting data see appendix tables C4.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Figure 6— Percentage of preschool children with nonemployed mothers enrolled in center-based programs, by age and household income: 1991



NOTE: For supporting data see appendix tables C4.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Employed mothers. The fact that low-income mothers were less likely to be working depressed their children's enrollment in center-based programs when children of employed and nonemployed mothers were not separated (Figure 3). ***While 3- to 5-year-old preschool children from employed-mother households with incomes of $15,000 or less (54 percent) were less likely than children of families with incomes over $50,000 (73 percent) to be enrolled in a center-based program, they were not significantly different in enrollment from middle-class employed-mother households with incomes of $30,000 to $50,000 (60 percent).*** The relationship between enrollment and income for 3- and 4-year-old children is similar to that for all 3–5-year-old preschool children. There is no relationship between enrollment and household income for 5-year-olds whose mothers are employed.

As graphed, enrollments appear to be higher at low- ($15,000 or less) and high-income levels (over $50,000) than among households with incomes between $15,000 and $30,000 (lower middle-income households). However, once we divided the sample into subgroups by age of child, employment status of mother, and income, the difference between the preschool enrollment of children from households with incomes of $15,000 or less and that of children from households with incomes of $15,000–$30,000 was not statistically significant. The difference between the enrollment

of children from households with incomes of $15,000–$30,000 and that of children from households with incomes exceeding $50,000 per year remained statistically significant. These results are consistent with findings from the National Child Care Survey 1990 (Hofferth et al. 1991).

Nonemployed mothers. The relationship between income and enrollment was linear among the preschool children of nonemployed mothers. As household income increased, enrollment in center-based programs rose. Only among children in households whose incomes fell under $30,000 were there no enrollment differentials.

Income Adjusted for Control Variables

Since there are other differences between low- and high-income families that might also affect enrollments, we adjusted for these differences using multivariate models. As shown in the bivariate analyses, enrollment increased with income. Children with household incomes of $50,000 or higher were more likely to be enrolled in a center-based program than children with household incomes of $30,000 to $50,000 (table 6), who were more likely to be enrolled than those with incomes under $30,000. The enrollment of low-income children with household incomes below $15,000 was comparable to that of children with incomes of $15,000 to $30,000; however, it was still lower than that of children in families with incomes of $30,000 or more, net of other factors. These results are similar to those in the bivariate analyses. The finding of parity of enrollment among children in households with incomes below $30,000 is consistent with public policies to increase enrollments among low-income families. It is also consistent with findings from other studies that show that while low-income children have reached parity in enrollment with households with incomes below $30,000, they have not reached parity with the vast bulk of middle-income households (incomes of $30,000 to $50,000) (Hofferth et al. 1991).

Table 6—Adjusted odds ratios of enrollment of preschool children in center-based programs, by household income: 1991

Variable	Odds ratio
Less than 15K v. 25–30K	1.051
15–25K v. 25–30K	0.969
30–50K v. 25–30K	1.491***
Greater than 50K v. 25–30K	3.263***

***p<.001.

NOTE: Odds ratios after controlling for age of the child, region of residence, urbanicity of residence, employment status of the mother, and the presence of the mother in the household.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

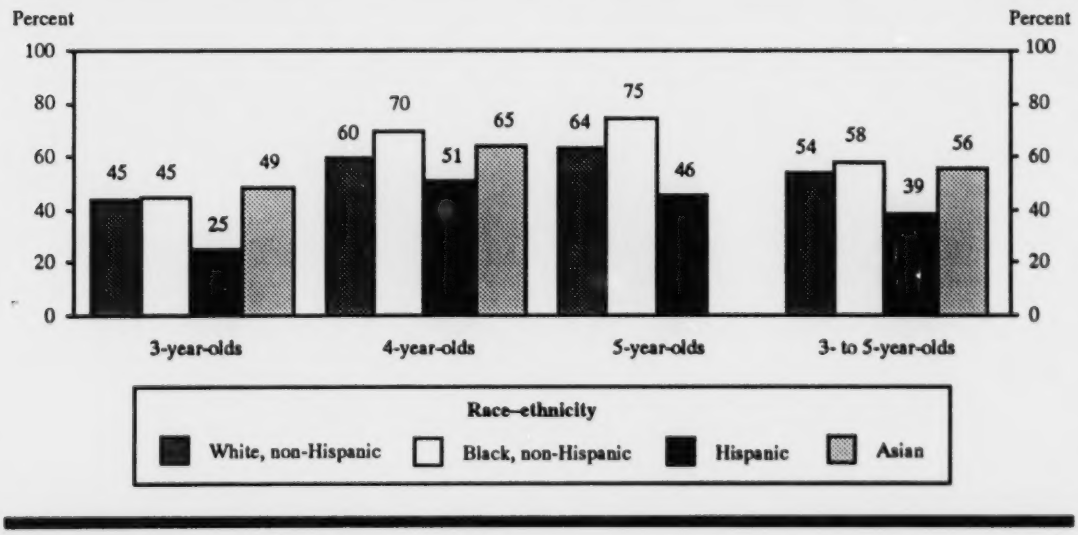
Race–ethnicity

Being from a minority racial–ethnic group does not necessarily place children at risk for school failure. Asian dropout rates have historically been quite low and, in recent years, blacks have dramatically improved their rates of school completion (Kaufman et al. 1992). Other groups, such as Hispanics, continue to show high rates of dropping out of school (Kaufman et al. 1992). While blacks have improved relative to whites in reading, mathematics, and science achievement, the gap between white and Hispanic achievement has not narrowed to the same extent (U.S. Department of Education 1993). White students continue to score higher on achievement tests in these subjects. In this section, the enrollments of Hispanic, non-Hispanic black, and Asian preschool children are compared with those of non-Hispanic white children.

Bivariate Analyses

Enrollments in center-based programs differed by race–ethnicity (figure 7). Across all age groups, black children were more likely to be enrolled in center-based programs than Hispanic children. White children were neither more nor less likely to be enrolled than black children. White children were more likely to be enrolled than Hispanic children among all 3–5-year-old preschoolers. Because of small sample sizes, the difference in enrollments of Asian children as compared with Hispanic children was significant only when all three age groups were combined.

Figure 7— Percentage of preschool children enrolled in center-based programs, by age and race-ethnicity: 1991



NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Race–ethnicity Adjusted for Control Variables

Consistent with the results presented in Figure 7, after adjusting for the age of child, region and urbanicity of residence, and the employment status and presence of the mother, a black child was neither more nor less likely to be enrolled in a center-based program than a white child, while a Hispanic child was considerably (45 percent, in terms of the adjusted odds ratios) less likely to be enrolled (table 7).

Table 7—Adjusted odds ratios of enrollment of preschool children in center-based programs, by race–ethnicity and urbanicity: 1991

Variable	Odds ratio	
	Without interaction	With interaction
Urbanicity	1.455***	1.647***
Race–ethnicity		
Black v. white	1.169	2.362**
Hispanic v. white	0.542***	0.720
Asian v. white	1.183	7.998*
Other v. white	1.033	1.135
Race–ethnicity and urbanicity		
Urban black v. urban white	—	0.440**
Urban Asian v. urban white	—	0.116*

*p<.05.
**p<.01.
***p<.001.
NOTE: Odds ratios after controlling for age of the child, region of residence, urbanicity of residence, employment status of the mother, and the presence of the mother in the household.
Both black and white children are of non-Hispanic origin.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

However, an interaction between race–ethnicity and urban residence was found. After the interaction between each racial–ethnic group and urbanicity was added to the model, urban children were still more likely to be enrolled in a center-based program than nonurban children. Black children became *more* likely to be enrolled than white children but black children living in urban areas were less likely to be enrolled in center-based programs than white children in urban areas. This suggests that in urban areas blacks are less likely to be enrolled relative to white children and in nonurban

that in urban areas blacks are less likely to be enrolled relative to white children and in nonurban areas they are more likely to be enrolled relative to white children. The same conclusion apparently holds for Asians as well.[7] Compared with whites, they are more likely to be enrolled in nonurban areas and less likely to be enrolled in center-based programs in urban areas.

Adjustment for Both Income and Race–ethnicity

Because race–ethnicity and income are so closely linked, the question arises as to whether the influence of race-ethnicity is due to race-ethnicity per se or to income. To examine this, 1) the relationship between race–ethnicity and enrollment, net of household income, 2) the relationship between income and enrollment, net of race–ethnicity, and 3) the presence of an interaction between race–ethnicity and income in their relationship with enrollment were examined (table 8). The relationship between income and enrollment was not affected by controlling for race–ethnicity. Tests were conducted for an interaction of income and race–ethnicity in their relationship with enrollment, but no interaction was found.

However, relative to a model without controls for income (table 7), the influence of race-ethnicity on enrollment changes once income is controlled. *In terms of the adjusted odds ratios, black children are one-third more likely to be enrolled in center-based programs than white children, controlling for family income. Hispanic children remain much less likely than white children to be enrolled.* These findings for blacks are consistent with public policies aimed at raising the enrollment levels of disadvantaged minority children. The findings highlight the low enrollments of Hispanic children relative to white and black children and suggest that Hispanic children are an important target for public policy attention.

Remaining Risk Factors

Household income and children's race–ethnicity are just two of several indicators commonly used to measure educational disadvantage (Huston 1991). Other risk factors may also represent differential family resources or access to resources, such as living in a single-parent family or living in a large family. Several studies have shown that the likelihood of poor school performance, being retained in school, and dropping out is much greater for children from single-parent families than those from two-parent families (Bianchi 1984; Kaufman et al. 1992). Since the primary caretaker for most children is usually the mother, the mother's characteristics, such as being poorly educated or having become a parent as a teenager, are also important. Both characteristics have been shown to reduce children's later educational attainment and earnings as young adults (Hofferth and Moore 1979).

The remainder of this section describes the bivariate relationship between each of the remaining risk factors and enrollment in early childhood programs. Since it is clear that models leaving out race–ethnicity and income will give misleading results, each of the risk factors was added one at a time to the models including the other control variables, race–ethnicity, and income to see whether it helped explain children's enrollment in center-based early childhood programs. Each table

[7]Hispanic children were still less likely to be enrolled but the coefficient was not significant because of a large standard error.

shows the odds ratio of a child being enrolled, using multivariate models that adjust for age, race–ethnicity, household income, maternal employment, presence of mother, region, and urbanicity.

Table 8—Adjusted odds ratios of enrollment of preschool children in center-based programs, by household income and race–ethnicity: 1991

Variable	Odds ratio
Household income	
Less than $15K v. $25–30K	1.028
$25–25K v. $25–30K	1.019
$30–50K v. $25–30K	1.432**
Greater than $50K v. $25–30K	2.548***
Race–ethnicity	
Black v. white	1.321**
Hispanic v. white	0.704***
Asian v. white	1.062
Other v. white	1.150

**p<.01.
***p<.001.
NOTE: Odds ratios after controlling for age of the child, region of residence, urbanicity of residence, employment status of the mother, and the presence of the mother in the household.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

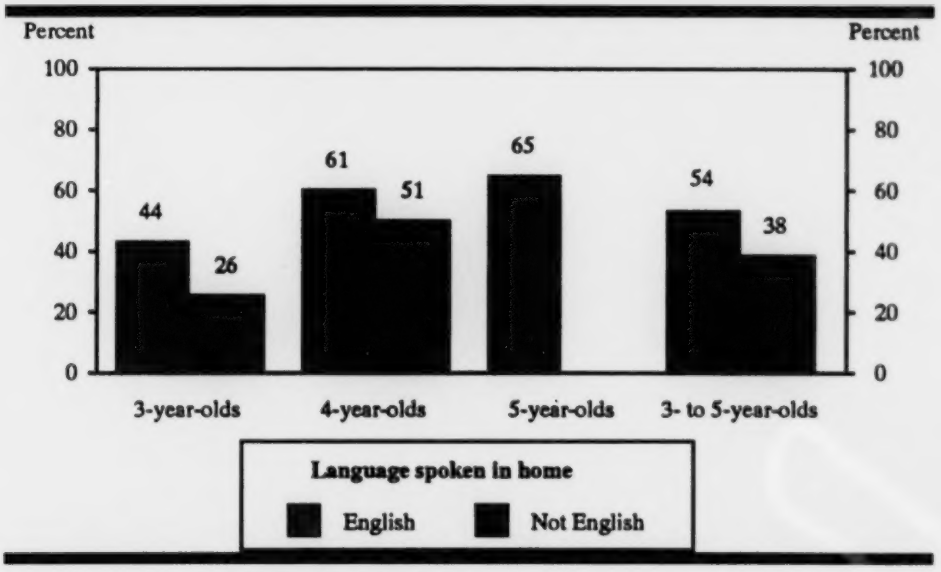
Language Spoken at Home

Language provides the necessary tools for learning. Non-English-speaking parents may encourage their children's language development by reading and talking to them in their language; consequently, the language spoken at home may not, by itself, constitute a risk factor (Department of Health and Human Services 1993). However, since a disproportionate number of non-English-speaking families are also poor and have little formal education, their children may face multiple barriers to experiencing a rich language environment (McDonnell and Hilll 1993). These families may also lack the information and resources to place their children in early childhood education programs.

Bivariate Analysis

Parents who use a language other than English as the primary language in the home are less likely than parents who use English to enroll their children in center-based programs (figure 8). This difference holds for all 3– to 5-year-old preschool children and for 3- and 4-year-olds but not for 5-year-olds. There are few 5-year-olds not yet enrolled in school whose parents speak a language other than English most at home.

Figure 8— Percentage of preschool children enrolled in center-based programs, by age and language spoken in the home: 1991



NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Multivariate Analysis

The lower enrollment among Hispanic children reported in Tables 7 and 8 may be a result of their parents' lower proficiency in English. Lower English proficiency may lead parents to reject English-speaking programs and prefer bilingual programs or it may prevent them from learning about center-based programs for which they are eligible.

To see whether the lower enrollment of Hispanic children is linked to home language use or to other characteristics of Hispanics, such as poverty and low levels of education, this relationship was examined controlling for income, race–ethnicity, and other factors (table 9). ***When these variables were added, language spoken at home was no longer associated with preschool enrollment.*** Consequently, the language spoken at home per se is not associated with reduced enrollment in early

childhood programs. Comparing table 9 with table 8, the relationship between Hispanic ethnicity and center-based program enrollment was reduced only slightly, so not speaking English at home cannot explain the influence of Hispanic background in reducing such enrollments.

Table 9—Adjusted odds ratios of enrollment of preschool children in center-based programs, by language spoken at home and race–ethnicity: 1991

Variable	Odds Ratio
Home language not English v. English	.798
Hispanic v. white	.759*

*p<.001.
NOTE: Odds ratios after controlling for household income, race–ethnicity, age of the child, region of residence, urbanicity of residence, employment status of the mother, and the presence of the mother in the household.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Family Composition

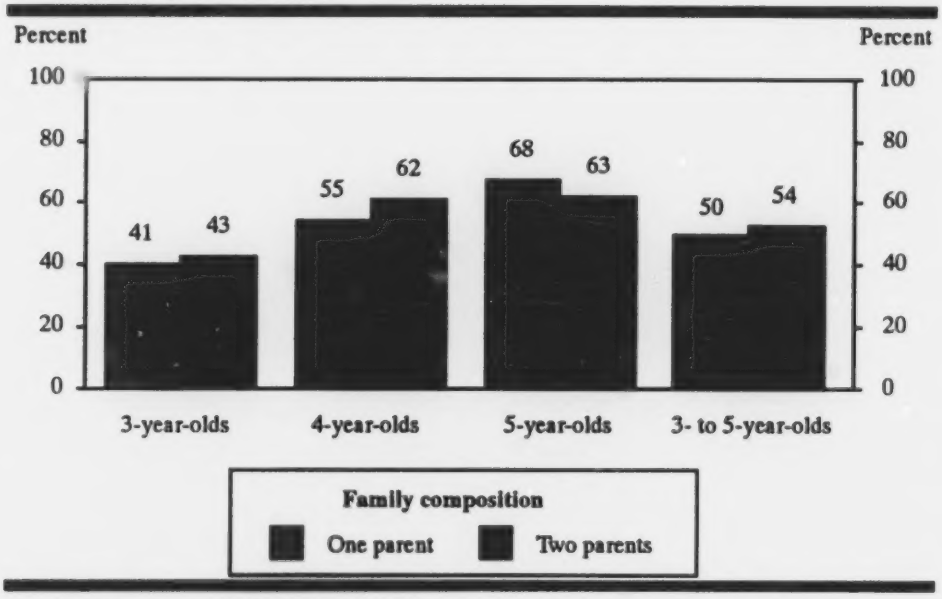
Children need close, enduring relationships with parents and other primary caregivers. Mothers who are raising their children without a spouse are more likely than mothers with a partner to exhibit anxiety, depression, and health and financial problems, and to rear their children in a punitive, inconsistent, and unresponsive manner, perhaps contributing to their children's distress and failure in school later on (McLoyd and Wilson 1991; McLanahan 1985). Many low income single parents are not employed; consequently, they may not place their children in early childhood programs that might help prepare them for school (Hofferth et al. 1991). However, recent research suggests that single parents may be more likely to place their children in center-based early childhood programs because of the availability of subsidies (Hofferth et al. 1991).

Bivariate Analysis

Consistent with offsetting influences of lower income but greater availability of subsidies described above, differences in enrollment in center-based programs by family composition were weak (figure 9). Four-year-old children living with a single parent were less likely to be enrolled in a center-based program than 4-year-old children in two-parent families. This is probably because 4-year-olds are the age group most likely to be enrolled in such programs, regardless of the employment status of the mother. Public subsidies primarily assist low income children with employed mothers. The fact that children of two parents were not more likely to be enrolled among the other age groups is probably due to the greater access of employed single parents (whose incomes are lower than those

of two-parent families) to subsidized center-based programs for their children, which may ameliorate the effect of not having a spouse to contribute to household income.

Figure 9— Percentage of preschool children enrolled in center-based programs, by age and family composition: 1991



NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Multivariate Analysis

Because the children of single parents are more likely to have other factors that place them at greater risk, such as being poor, it is important to control for income to test whether family composition or another related characteristic leads to lower enrollment. *Once such other factors are controlled, children living with one or no parent are no more or less likely to be enrolled in a center-based program than children in two-parent families (table 10), regardless of age of the child.*

Table 10—Adjusted odds ratios of enrollment of preschool children in center-based programs, by number of parents: 1991

Variable	Odds ratio
No parents v. two parents	.401
One parent v. two parents	1.031

NOTE: Odds ratios after controlling for household income, race–ethnicity, age of the child, region of residence, urbanicity of residence, employment status of the mother, and the presence of the mother in the household.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

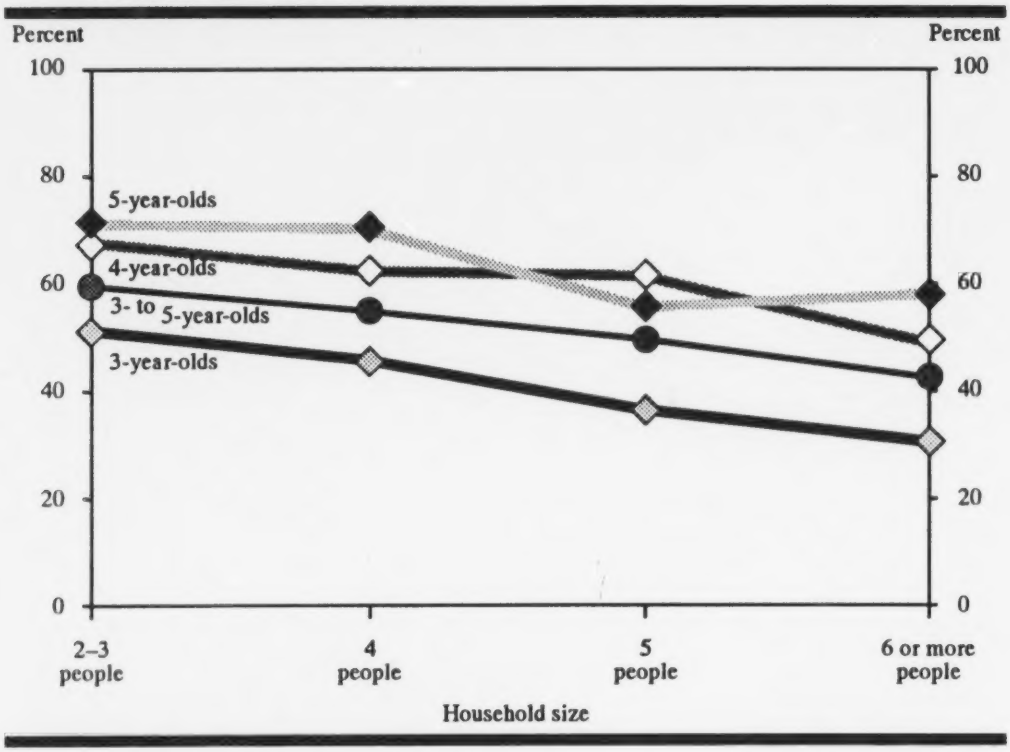
Household Size

Household size, the number of persons living in a household, can impact upon its members in several ways. First, the larger the number of household members, the more resources needed to maintain an equivalent standard of living. Large households may not be able to provide the same resources for each member, including enrolling children in center-based programs and offering the same intensive *adult* attention that small families can. On the other hand, large households have more members who can potentially care for children while parents work outside the home or engage in other activities. Thus, large households may be less inclined to use center-based programs both because they cannot afford it and because care can be provided by other household members such as older siblings. A recent report (Hofferth et al. 1991) shows that large households (three or more children) are much less likely to use a center-based program for their youngest child and much more likely to use relatives as care providers than smaller households. Other work has shown that the availability of an adult family member in the household other than the two parents reduces the use of formal arrangements and increases the use of informal ones (Hofferth and Wissoker 1992).

Bivariate Analysis

Consistent with these findings, 3- and 4-year-old children in large households (6 or more members) were less likely to be enrolled in center-based programs than children in small households (two or three members) (figure 10). Among 5-year-olds there was no difference in enrollment by household size.

Figure 10— Percentage of preschool children enrolled in center-based programs, by age and household size: 1991



NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Multivariate Analysis

Controlling for income and other factors, enrollment in center-based programs decreases with household size. In terms of the adjusted odds ratios, preschool children in households with four members are 24 percent less likely to be enrolled in a center-based program than comparable children in households with 2 or 3 members (table 11). The more members, the stronger the effect. For example, preschool children in five-person households are 33 percent less likely to be enrolled, and preschool children in households of six or more persons are 47 percent less likely to be enrolled than preschool children in households of 2 or 3 members. From the available data it cannot be determined whether fewer resources relative to needs or more potential child care providers explains the result; both are likely to contribute.

Table 11—Adjusted odds ratios of enrollment of preschool children in center-based programs, by household size: 1991

Variable	Odds ratio
Household size	
Four persons v. 2–3 persons	.763**
Five persons v. 2–3 persons	.666***
Six or more persons v. 2–3 persons	.532***

**p<.01.
***p<.001.
NOTE: Odds ratios after controlling for household income, race–ethnicity, age of the child, region of residence, urbanicity of residence, employment status of the mother, and the presence of the mother in the household.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

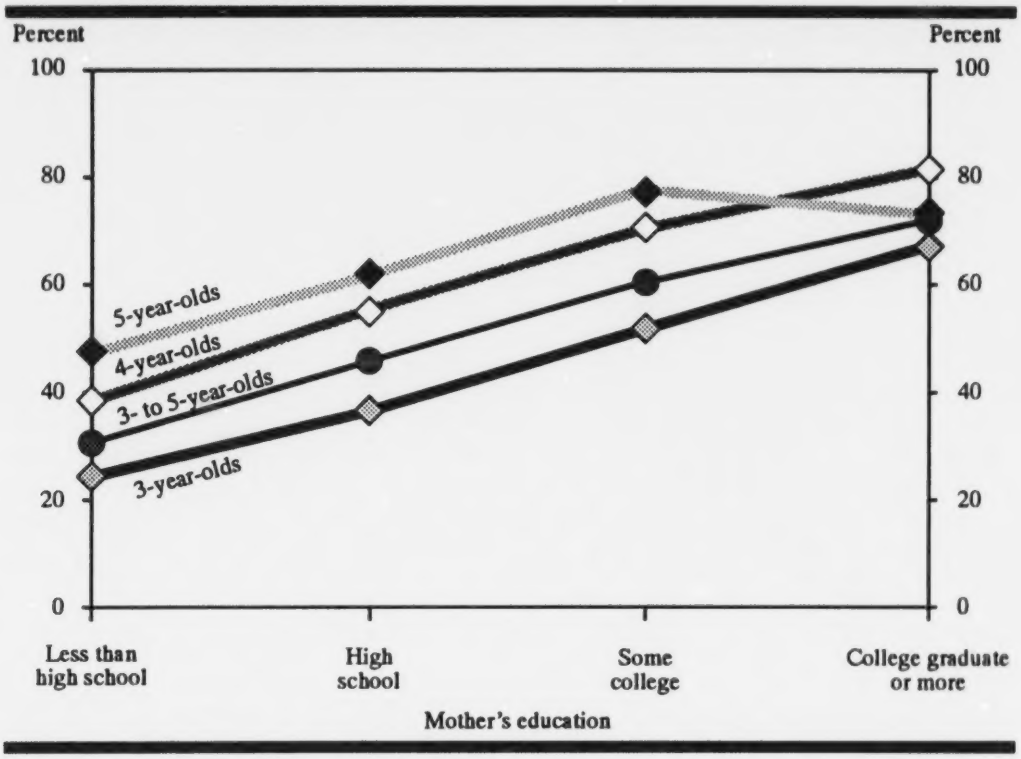
Educational Level of Mother

Several recent reports have demonstrated that mothers who have not completed their high school degree are much less likely than mothers who have completed some college or have had some graduate school training to place their children in center-based early childhood programs (Hofferth et al. 1991; Zill 1992b). This may be due to poorly educated mothers' lack of information about or appreciation of the value of these programs.

Bivariate Analysis

A clear association between the educational level of the mother and the enrollment of her children in center-based programs is shown in figure 11. Regardless of whether the child is 3, 4, or 5 years old, the more education the mother has, the more likely the child is to be enrolled in a center-based program. The only exception is that, for 5-year-olds, children whose mothers have a college degree are not more likely than those with only a high school degree to be enrolled in a center-based program, probably because of the size and selectivity of the sample of 5-year-olds not enrolled in kindergarten.

Figure 11— Percentage of preschool children enrolled in center-based programs, by age and mother's education: 1991



NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Multivariate Analysis

Because education is associated with earnings and because men and women who are similar tend to marry, less educated parents will tend to live in households with lower earnings. Thus, the relationship shown in figure 11 may be due to the lower levels of income that less educated mothers have, rather than to their lack of knowledge about or appreciation of the importance of early childhood education. These hypotheses were examined by testing the relationship between the educational level of the mother and enrollment levels of 3- to 5-year-old preschoolers controlling for income, race–ethnicity, and our five control variables.

The results suggest that the level of the mother's education is associated with the child's enrollment in center-based programs even after controlling for other factors related both to education and enrollment (table 12). In terms of the adjusted odds ratios, and relative to preschool children whose mothers have only a high school diploma or GED, preschool children of mothers without a high school diploma or GED are 38 percent less likely to attend a center-based program, whereas preschool children of mothers who have attended college are 53 percent more likely and those who have a college degree are twice as likely to attend a center-based program.

Earlier we argued that children of Hispanic background may have a variety of disadvantages, including not speaking English, lower maternal education, and lower household income. We suggested that the influence of Hispanic race–ethnicity would be explained if its influence disappeared after including one of these variables. We did not find that the influence of Hispanic background was reduced after controlling for either the language spoken at home or household income. However, the effect of Hispanic background is no longer statistically significant once the mother's education is taken into account (compare table 12 with table 8). This suggests that a large part of the role played by Hispanic origin in depressing program enrollment is attributable to the lower education of Hispanic mothers. That is, Hispanic mothers enroll their children in center-based programs at lower than average rates, in part, because they have lower levels of education. Once education is controlled, Hispanic mothers are neither more nor less likely than others to enroll their preschool children in center-based programs.

Table 12—Adjusted odds ratios of enrollment of preschool children in center-based programs, by maternal education and race–ethnicity: 1991

Variable	Odds ratio
Maternal education	
Less than high school v. high school	0.622***
Some college v. high school	1.529***
College grad v. high school	2.035***
Race–ethnicity	
Asian v. white	0.966
Black v. white	1.381***
Hispanic v. white	0.835
Other v. white	1.179

***p<.001.

NOTE: Odds ratios after controlling for household income, race–ethnicity, age of the child, region of residence, urbanicity of residence, employment status of the mother, and the presence of the mother in the household.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Age when Mother Became Parent

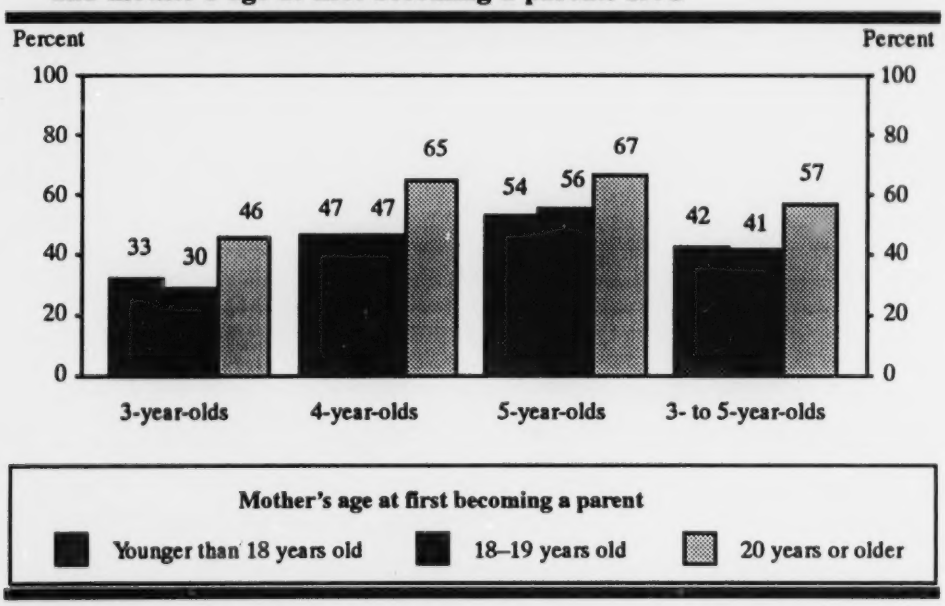
Having a child as a teenager, particularly while the mother is still in high school, may result in her dropping out of school in the short term (Hofferth, 1987a,b). In the long run it has been

associated with a greater likelihood of the mother being single, poor, and having a child with behavior problems and poor school performance (Hofferth 1987a,b). Although there are increasing numbers of programs targeted at teenage mothers, not all provide early childhood programs for their children. Young mothers who are not employed may not want to send their children to early childhood programs. Young mothers who are employed may prefer to have their own mothers care for their children (Kisker and Silverberg 1991). In either case, their children may not benefit from early childhood program participation.

Bivariate Analysis

Early childhood program enrollment increases with the age of the mother when she first became a parent. Three- to 5-year-old preschool children whose mothers had first become parents as teenagers were less likely to be enrolled in a center-based program (40 percent) than were those whose mothers were older when they first became parents (57 percent) (figure 12). For 3- and 4-year-olds, enrollments differed primarily among children of mothers who became parents as teenagers and mothers who became parents at age 20 or older. For 5-year-old preschoolers, there was no association between age at which mother first became a parent and enrollment.

Figure 12— Percentage of preschool children enrolled in center-based programs, by child's age and mother's age at first becoming a parent: 1991



NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Multivariate Analysis

The relationship between the age a mother first became a parent and the enrollment of her child in a center-based program may be due to other problems she has, such as being poor, single, or lacking a high school diploma, rather than to her young age. Consequently, the relationship was examined in a multivariate framework, controlling for these and other factors. *Net of the control variables, preschool children born to a mother who first became a parent as a teenager were less likely to be enrolled in a center-based program than were preschool children whose mothers were 20 years old or older when they first became a parent* (table 13). In terms of the adjusted odds ratios, children of mothers who were less than 18 when they first became a parent were 28 percent less likely and children of mothers who were 18 or 19 at the time they became a parent were 32 percent less likely to be enrolled in a center-based program than children of mothers who were 20 or older when they first became a parent.

Table 13—Adjusted odds ratios of enrollment of preschool children in center-based programs, by age of mother when first became a parent: 1991

Variable	Odds ratio
Age when first became parent	
Less than 18 v. 20+	.720**
18–19 v. 20+	.678***

**p<.01.
***p<.001.
NOTE: Odds ratios after controlling for household income, race–ethnicity, age of the child, region of residence, urbanicity of residence, employment status of the mother, and the presence of the mother in the household.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Disability Status

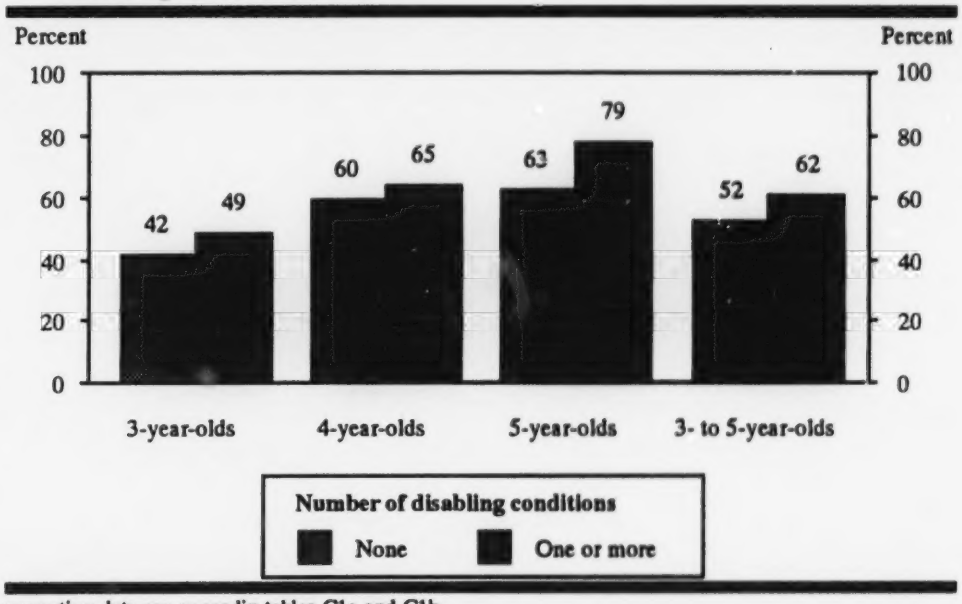
Children who are tired, hungry, or sick cannot concentrate in school. Inadequate nutrition and poor health are major obstacles to school readiness (U.S. Department of Health and Human Services 1993). A variety of factors influence the health of children, including genetic traits, maternal habits and lifestyle, lack of adequate prenatal care, proper health care and nutrition, and injuries. Children who suffer from a mild or severe disability need special attention. Recent legislation (P.L. 99-457, now the Individuals with Disabilities Education Act) requires states to make early childhood programs available to children with disabilities. However, children often are not identified until they enter a program. Thus, it is likely for two reasons—the increased likelihood of a disability being

identified if in a program and new legislation requiring children so identified to be served—that disabled children will be more rather than less likely to participate in an early childhood program.

Bivariate Analysis

Three- to 4-year-old preschoolers whose parents reported they had a disability were as likely to be enrolled in a center-based program as those whose parents did not report that they had a disability (figure 13).[8] Among 5-year-old preschoolers, the enrollment of children with a disability consistently exceeded those without a disability. When the age groups were combined, preschoolers with a disabling condition were more likely to be enrolled in a center-based program (62 percent) than those without such a condition (52 percent). This suggests that the lack of significance among 3- to 4-year-olds is due to the small number identified as having a disabling condition.

Figure 13— Percentage of preschool children enrolled in center-based programs, by age and disabling conditions: 1991



NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Multivariate Analysis

In order to adjust for other factors that might also be associated with preschool enrollment, the relationship between children's disabling condition and enrollment was examined, controlling for

[8]Disability is defined by 11 categories used by the Department of Education's Office of Special Education and Rehabilitation Services.

race–ethnicity, income, and our control variables. *Net of other factors, preschool children who have a disabling condition are more likely to be enrolled in a center-based program than preschool children who do not have such a condition* (table 14). In terms of the adjusted odds ratios, children who had a disabling condition were 52 percent more likely to be enrolled in a center-based program than children who did not have such a condition. Having a disabling condition is the only risk factor that increases the likelihood of being enrolled in a center-based program. The results are consistent with two explanations: first, children are generally not screened or tested for disabilities until they enter a center-based program and, second, once so identified, whether through the medical/social service network or center-based program, the law requires that disabled children be served in such programs. As children reach school age they are increasingly likely to have disabilities identified and, if identified, there is a high likelihood that they will be served.

Table 14—Adjusted odds ratios of enrollment of preschool children in center-based programs, by presence of disabling condition: 1991

Variable	Odds ratio
Disabling condition v. none	1.519**

**p<.01.
NOTE: Odds ratios after controlling for household income, race–ethnicity, age of the child, region of residence, urbanicity of residence, employment status of the mother, and the presence of the mother in the household.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Risk Factor Score

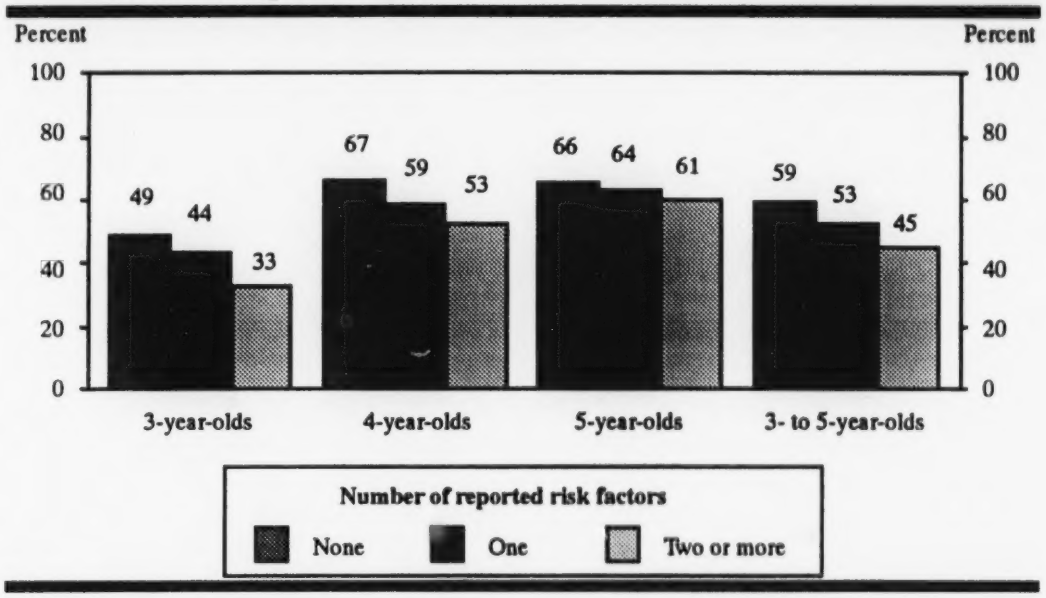
The relationship between the number of risk factors children have and center-based program enrollment was examined. While several of these risk factors were found to strongly influence enrollment in center-based programs when considered individually, having several risk factors may be even more detrimental to enrollment.

Bivariate Analysis

Figure 14 summarizes the relationship between having one or more risk factors and enrollment in center-based programs. The enrollment of all 3- to 5-year-old preschool children in center-based programs declines consistently as the number of reported risk factors increases. The pattern is slightly different for 3- and 4-year-olds. Three-year-olds with two or more risk factors are less likely to enroll in center-based programs than those with one or none. Having only one does not increase risk of not enrolling in a center-based program. In contrast, 4-year-olds with one or more risk factor are less likely to be enrolled than those with none. For 4-year-olds, there is no difference in enrollment among

those with one or two or more risk factors. The number of reported risk factors did not affect the enrollment of 5-year-old preschoolers.

Figure 14— Percentage of preschool children enrolled in center-based programs, by age and number of reported risk factors: 1991



NOTE: For supporting data see appendix tables C1a and C1b.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Multivariate Analysis

Table 15 shows the influence of the number of risk factors on enrollment in center-based early childhood programs controlling for income, race–ethnicity, age of the child, region, urbanicity, employment of the mother, and the presence of the mother in the household. *The number of risk factors remains an important predictor of program enrollment net of other factors. With each additional risk factor indicated by characteristics of the child and family, the likelihood of enrolling a child in a center-based program declines by about 16 percent,* in terms of the adjusted odds ratios (table 15).[9] Having two risk factors would reduce enrollment by about 32 percent.

While this is a strong effect, it is clear from earlier findings that single risk factors by themselves have even stronger effects. Consequently, and in contrast to the conclusions of Sameroff and his colleagues (1987), *which* risk factor children have is important. Some are more important

[9]Calculated as (Odds ratio-1)*100. This represents the percent increase (or decrease) in the adjusted odds of enrolling in a preschool program associated with each additional risk factor reported.

than others (low income and low maternal education, for example), and some, such as disability status, result in *increased* rather than reduced enrollment.

Table 15—Adjusted odds ratios of enrollment of preschool children in center-based programs, by number of risk factors: 1991

Variable	Odds ratio
Number of risk factors	.839***

***p<.001.
NOTE: Odds ratios after controlling for household income, race-ethnicity, age of the child, region of residence, urbanicity of residence, employment status of the mother, and the presence of the mother in the household.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

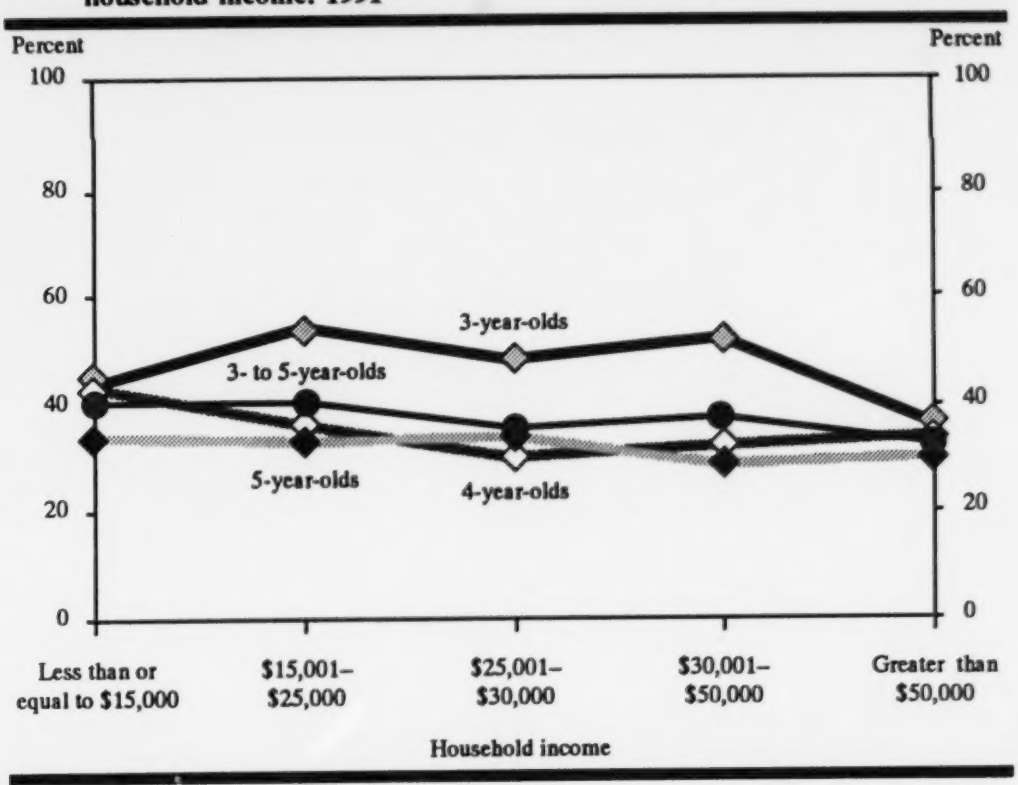
Enrollment Schedule (Part-Day v. Full-Day) in Center-Based Programs

Even though there may be minimal differences by income in enrollments in programs in general, there may be differences by income in access to programs that meet parents' schedules. This section addresses the following question: are children from low-income households who are enrolled in center-based programs less likely to be enrolled the full day than children not in low income households? From the perspective of serving children whose mothers are employed, it is important to know whether low-income parents have greater or less access to full-day programs than other employed parents.

Income. There were no consistent differences in enrollment in full-day center-based programs by household income (figure 15). Because there were no differences in full-time or part-time enrollment by income in these simple analyses, we did not pursue this in a multivariate framework.

Maternal Employment Schedule. The more important distinction was whether mothers were employed full time or part time. Figure 16 shows that the relationship between employment status of the mother and enrollment in full-day programs was much stronger than the relationship between income and enrollment (figure 15). Children of mothers who were employed full-time were much more likely to be enrolled in a full-day center-based program than children of mothers who were employed part time, who were in turn more likely to be enrolled the full day than children of mothers who were not employed at all (figure 16).

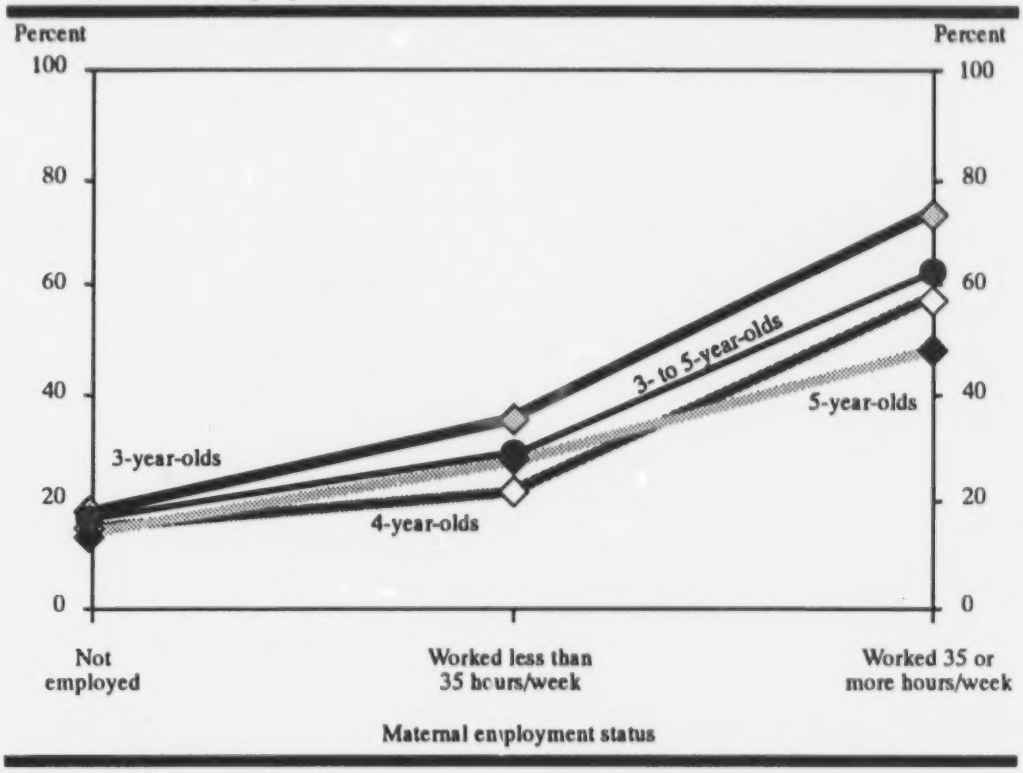
Figure 15— Percentage of enrolled preschool children attending full-day programs, by age and household income: 1991



NOTE: For supporting data see appendix tables C5.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Figure 16— Percentage of enrolled preschool children attending full-day programs, by age and maternal employment status: 1991



NOTE: For supporting data see appendix tables C5.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Summary: Access to Center-Based Programs

For the most part, preschool children who are educationally disadvantaged, as measured by each risk factor, are less likely than advantaged children to be enrolled in center-based programs. Low-income children are less likely than high-income children to be enrolled. Children of less educated mothers and children whose mothers' became parents as teens are less likely to be enrolled. There are several exceptions. First, black children are more likely to be enrolled once other factors that influence enrollment are taken into account, and Hispanic children are neither more nor less likely to be enrolled once maternal education is controlled. Second, whether or not English is used as the primary language in the home does not affect children's enrollment in center-based programs. Third, whether a child is living with no, one, or two parents does not affect the probability of program enrollment, net of other factors. Fourth, children with disabilities are more likely than those without disabilities to be enrolled in a center-based program. This probably reflects both the greater likelihood of identifying disabilities once enrolled and the requirement to be served, once diagnosed. Given all these exceptions to the expected effects of the risk factors examined here, the effect of total

number of risk factors children have on enrollment is weaker than others have found in previous research.

Effects of Subsidies

When comparing figure 11, enrollment by education of the mother, with figure 5, enrollment by income among employed mothers, a better understanding is gained of the effects of subsidizing center-based programs. Income and educational levels of the population are strongly correlated (Sewell et al. 1976). Without subsidies, one would expect that enrollment levels by income would be similar in pattern to those of maternal education, increasing monotonically in the same way that enrollment increases with years of mother's schooling (Hofferth et al. 1991). In fact, the association between income and enrollment (figure 5) is much weaker than that between education and enrollment (figure 11).

The results suggest that while subsidies to low-income families for center-based early childhood programs have not completely eliminated income differences in enrollment (other confounding factors, such as maternal education, remain), they have reduced them substantially and markedly improved the ability of poor and near-poor families to enroll their children in center-based programs relative to middle-income families. These results are consistent with earlier findings regarding levels of enrollments of low-income families (Hofferth et al. 1991).

Groups that still have low levels of participation include low-income 4-year-olds with a nonemployed mother and low-income 3-year-olds with an employed mother. Recent (1990) legislation has authorized funds to expand Head Start to enroll all eligible children. In the past, this has been interpreted to mean 4-year-olds in part-day programs. While 3-year-olds were served in 1991, they were not specifically targeted for increased coverage by Head Start, nor, since it was still only part-day, was Head Start likely to appeal to full-time employed mothers.

III. The Quality of Center-Based Early Childhood Programs

Measurement of Quality

Even if low income children had the same access to center-based programs as high income children, lack of access to programs of comparable quality would be of concern. The two measures of quality used in this report are the actual number of children in the child's group and the ratio of children to staff, based upon parent reports. In 1991, group sizes for 3- to 5-year-old preschoolers averaged 14 to 15 children, and child/staff ratios averaged 1:7 to 1:8, according to parental reports from the NHES, with very little variation by characteristics of the child or family (West et al. 1993). These averages are similar to those reported by parents in other studies (Hofferth et al. 1991) and to those reported by programs (Willer et al. 1991).

Because characteristics of programs vary in accordance with state standards, simple levels across states and localities may not be good indicators of the quality of programs American children experience. A better measure may be the extent to which characteristics of children's programs meet state or national standards.

Each state has established certain standards that providers must meet in order to be licensed in that state.[10] These standards reflect prevailing views about the quality of care in each state. Not meeting state standards indicates poor quality of care and may indicate care that is illegal (if not exempt from standards). Although states exempt certain types of programs,[11] many nonregulated programs voluntarily meet these standards. Since different states have considerably different standards for care, whether a center meets its own state standard may not be appropriate for a comparison of quality across states. For example, low-income children in a high-standard state may be in poorer quality care than most children in that state but may still be in better care than the majority of children in a low-standard state. Cross-state differences in standards may reduce any association between social and economic advantage and these quality measures. Consequently this report uses two measures of quality of programs: a) the proportion of children enrolled in programs that meet standards established by state regulations (Morgan 1992), and b) the proportion of children enrolled in programs that meet standards recommended by the NAEYC (Hayes et al. 1990). The former varies by state; the latter is a set of voluntary national guidelines that is the same for all states.

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[10]While all states and the District of Columbia regulate child/staff ratio in centers, group size is regulated in fewer than half of the states.

[11] Church-sponsored programs are exempt in some states and public school-sponsored programs and Head Start are exempt in all states because they have their own standards.

Differences in Meeting Standards

Univariate Analysis

Table 16 shows the percentage of children enrolled in programs meeting state and NAEYC standards for group size and child/staff ratio. *In 1991 a large percentage of children (in states that set standards) were in programs that met their state standards for group size (79 percent) and child/staff ratio (95 percent) and an equally large percentage were in programs that met the recommended standards set by the NAEYC for group size (91 percent) and child/staff ratio (89 percent).*[12] These results are consistent with the Profile of Child Care Settings study, which obtained its reports of group size and number of staff from the directors of center-based programs (Kisker et al. 1991). According to that study, 82–94 percent of center-based programs met their state regulations for group sizes and child/staff ratios for 3–5-year-olds,[13] and 56–84 percent of programs met NAEYC group size and child/staff ratio recommendations.[14] The fact that the percentage of preschool children whose programs met NAEYC standards for group size and child/staff ratios are somewhat higher based upon parent than based upon center director reports may be due to the fact that, because of absenteeism, parents see fewer children than are actually enrolled. Their numbers reported are, consequently, smaller than those of providers. (For more information see Appendix A).

Table 16—Percentage of preschool children in center-based programs that meet state and NAEYC standards: 1991

	Group size	Child/staff ratio
Percent meeting state standard	79.2	94.8
Percent meeting NAEYC standard	90.8	88.5

NOTE: For additional information see Appendix Table C6.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Bivariate Analysis: Standards for Group Size and Child/Staff Ratio by Income

Figure 17 shows the percentage of children whose programs met NAEYC and state standards for group size, by the income of the household. Figure 18 shows the percentage of children whose

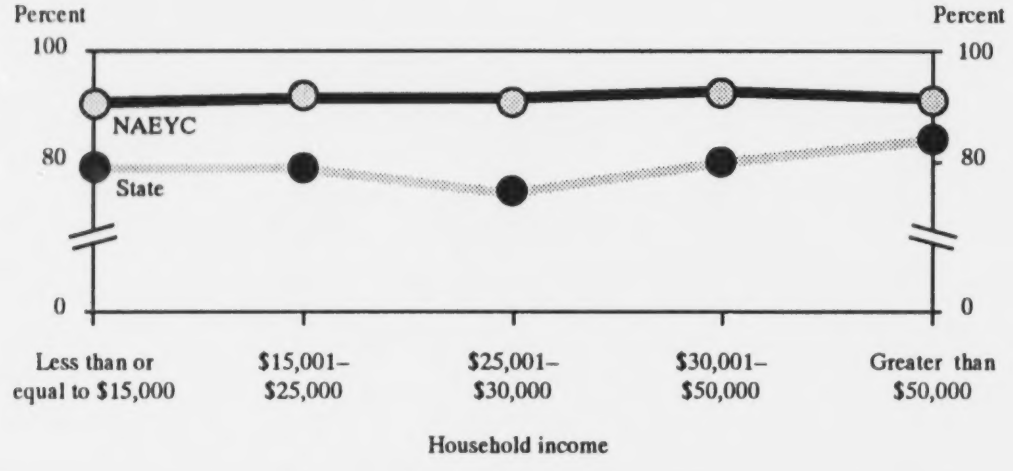
[12]The slightly lower proportion of children in programs meeting state standards for group size may be related to the characteristics of states that regulate group size.

[13]Eighty-two percent of 5-year-olds' programs met state regulations for group size, and 94 percent of 3-year-olds' programs met state regulations for child/staff ratio.

[14]Fifty-six percent of 5-year-olds' programs met NAEYC standards for child/staff ratio and 84 percent of 3-year-olds' programs met NAEYC standards for group size.

programs met NAEYC and state standards for child/staff ratio, by household income. Although the relationships between income and whether the program meets state standards for group size (figure 17) and either state or NAEYC standards for child/staff ratio (figure 18) both appear curvilinear as graphed, there is no relationship between income and whether children were enrolled in programs meeting state standards for group size or child/staff ratio, nor is there a relationship between income and whether children's programs meet NAEYC standards for group size. There is an association between income and the percentage of children in programs meeting NAEYC standards for child/staff ratio that is curvilinear. Low- and high-income children were more likely than middle income children to be enrolled in center-based programs that meet NAEYC standards for child/staff ratio (figure 18). This suggests that children from high-income and low-income families enrolled in center-based programs were in programs of somewhat higher quality than children from middle income families. However, the degree of variation by income level was small.

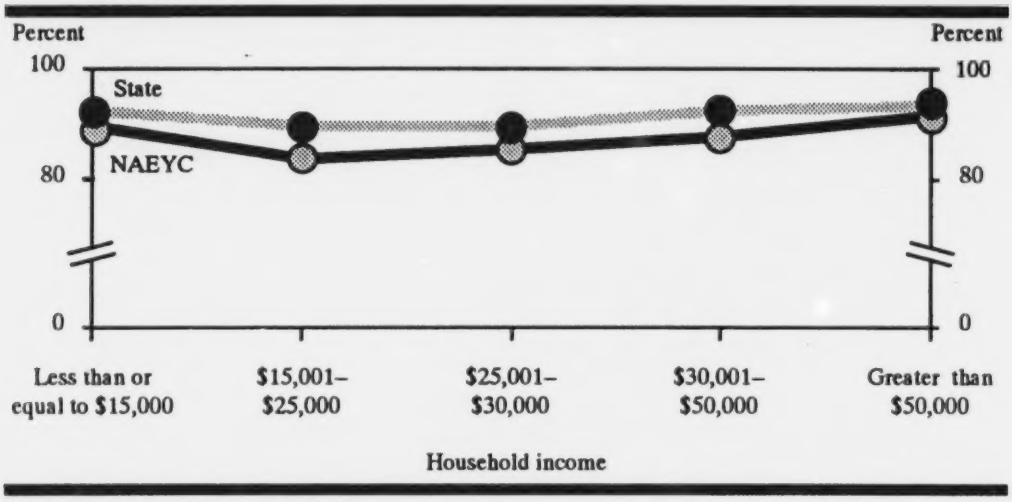
Figure 17— Percentage of preschool children enrolled in center-based programs, whose programs met NAEYC or state standards for group size, by household income: 1991



NOTE: For supporting data see appendix tables C6.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Figure 18— Percentage of preschool children enrolled in center-based programs, whose programs met NAEYC or state standards for child/staff ratio, by household income: 1991



NOTE: For supporting data see appendix tables C6.

SOURCE: U.S. Department of Education, National Household Education Survey of 1991 (NHES:91), Early Childhood Education (ECE) Component.

Multivariate Analysis: Standards for Child/Staff Ratio by Income and Race–Ethnicity

It was important to test whether the curvilinear relationship between income and enrollment in a program meeting NAEYC standards for child/staff ratio holds after controlling for other variables that might affect this relationship—race–ethnicity, urbanicity, region, age of child, maternal employment, and presence of mother. A comparable analysis was also performed to determine whether there was a relationship between income and whether a child was enrolled in a program meeting state standards for child/staff ratio after controlling for the same factors.[15]

State Standards

Preschool children in the Northeast were less likely to be enrolled in center-based programs that met state standards than comparable children in the South. This is consistent with the higher standards set in northeastern states. The higher the standards, the less likely programs are to meet them. On the other hand, states with higher standards may permit more exemptions, and this may also explain regional differences in the proportion of children in programs meeting state standards. Black preschool children and children of "other" races and ethnicities, groups that were either unspecified or too small to analyze separately, were less likely to be in programs meeting state standards than comparable white children.

[15]Because so many states did not have standards for group size and, therefore, group size provided a weaker test, these regressions were not run for group size.

NAEYC Standards

Although they were less likely to be enrolled in programs meeting state standards, black preschool children were more likely to participate in programs meeting NAEYC standards than were white preschool children (table 17). The range of state standards is great, with some states requiring considerably fewer children per staff than NAEYC recommends. Blacks may have greater access to Head Start and state-funded preschool programs that are exempt from state licensing standards but which must meet the guidelines or standards of school systems or other organizations (such as religious organizations and Head Start). Such programs may meet NAEYC standards but not state standards in high standard states. The group sizes and child/staff ratios of public school-based programs, for example, exceed those of licensed independent nonprofit centers, but the former offer better-educated and better-trained teachers and lower teacher turnover, factors that may outweigh the effects of larger numbers of children (Kisker et al. 1991).

Preschool children in the South were in programs least likely to meet NAEYC standards. Regional differences probably reflect differences in the strictness of state standards. Standards in many Southern states are not as high as in other regions (Morgan, 1992), so it is easier for programs to meet their state's requirements. However, though they meet state standards, their programs fall short of meeting the professional guidelines recommended by NAEYC. Three-year-old children were more likely than 4-year-old children to participate in programs meeting NAEYC standards.

While the coefficients describing the relationship between enrollment in programs meeting professional standards and income was consistent with the curvilinear relationship depicted in the bivariate analysis, the coefficients were not statistically significant. *Thus while the simple analysis supported it, the multivariate analysis fails to support the hypothesis that children's program quality differs significantly by household income.*

Table 17—Adjusted odds ratios of children's programs meeting state and NAEYC standards for child/staff ratio, by age, household income, maternal employment, race–ethnicity, urbanicity, region and presence of mother: 1991

Variable	State Standards Odds ratio	NAEYC Standards Odds ratio
Age 3 v. age 4	1.336	1.718**
Age 5 v. age 4	0.779	0.749
Income < 15K v. 25–30K	1.729	1.342
Income 15-25K v. 25-30K	0.930	0.866
Income 30–50K v. 25–30K	1.218	1.141
Income > 50K v. 25-30K	1.408	1.633
Mother employed v. not employed	0.989	0.938
Black v. white	0.416**	1.623*
Hispanic v. white	0.538	0.971
Asian v. white	0.302	1.437
Other v. white	0.216**	0.713
Urban v. non-urban	1.232	0.840
Northeast v. South	0.287***	3.326***
Central v. South	1.288	2.375***
West v. South	0.852	1.968***
No mother v. mother	2.411	1.545

*p<.05.
**p<.01.
***p<.001.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Other Risk Factors

Based upon analyses comparable to those reported in Part II, we found no other individual risk factors to have an impact on whether children were enrolled in programs that met either state or NAEYC standards. These results are not presented here.

IV. Summary and Conclusions

This report has examined two issues: 1) Do educationally disadvantaged or at-risk preschool children have similar access to center-based early childhood programs as advantaged children do? 2) Are their programs of comparable quality?

Access

The answer to the first question is a qualified no; it depends upon the measure of risk. Some at-risk groups have more and others less access, measured by their level of utilization. Thus, the overall risk factor index was only weakly related to lower enrollment. Several commonly used measures of risk were found to be associated with lower enrollment in center-based programs both when examined individually and net of other factors. These include being a member of a household with an income below the poverty line, being a child of a poorly-educated mother or a mother who was a teenager when she first became a parent, and living in a large household (6 or more members). Two risk factors were not found to be associated with lower enrollment: living with only one parent, and having a disability. In fact, children with disabilities were more likely than children without disabilities to be enrolled in a center-based program. This is consistent with efforts to identify such children early and mandates to serve those so identified. One risk factor, speaking a language other than English in the home, was initially associated with lower enrollment in center-based programs in bivariate analyses, but the relationship was not observed when other factors, such as income, race–ethnicity, urbanicity, region, age of child, maternal employment, and presence of the mother, were controlled.

Minority race–ethnicity was not consistently associated with lower enrollment in center-based programs. Hispanic children were the only ethnic group found to have lower enrollment in a center-based program than white children. However, this is apparently due to the lower educational levels of Hispanic mothers, since the difference was not observed once maternal education was controlled. Controlling for other factors, black children were more likely to be enrolled than white children. This finding was not evident in the bivariate analysis, but emerged once household income was controlled.

The difference between the relationship of race–ethnicity to enrollment and that of other factors, such as maternal education, must be emphasized. Through subsidies, public and private agencies can redress enrollment differences between disadvantaged groups, and the results of this study are consistent with public efforts to reduce discrepancies by race–ethnicity and disability status. Black children were actually more likely to be enrolled than white children once other differences between blacks and whites were taken into account. This is not the case for the relationship between education of the mother and center-based program enrollment. Differences between children of more- and less-educated mothers remained even after controlling for employment status and other differences. This suggests that removing barriers to access per se will not eliminate differences in *use* of center-based programs. Educating parents about their benefits is important.

Although we continue to find differences in enrollment by income after controlling for a variety of other factors, the fact that enrollments do not differ among those with incomes under $30,000, and the fact that black children and disabled children are more likely to be enrolled than white and nondisabled children, are consistent with public policy efforts to target assistance to disadvantaged families. Hispanic children are clearly an important target for public policy attention since their enrollment is quite low relative to that of white children.

Quality

On the question of whether disadvantaged children have access to programs of similar quality, the answer is still that we do not know. Based upon whether the child/staff ratio of the child's program meets state and NAEYC standards, we were unable to identify differences by household income or other risk factors in program quality. Only in the bivariate analysis did the results support other studies that have found quality to be somewhat lower for middle-income than for high-income children. The analyses did not show significant income differences in enrollment in programs that met state or NAEYC standards for child/staff ratio net of other factors. This suggests that, on this measure, at least, low income children's program quality does not differ from that of high-income children.

Black children were less likely than white children to be enrolled in programs that met state standards, but more likely to be enrolled in programs that met NAEYC standards. These findings may reflect their greater access to Head Start and state-funded center-based programs that are exempt from state licensing standards but which are subject to oversight by school systems or national organizations, including the federal government. Finally, the finding that 3-year-olds are more likely than 4-year-olds to be in programs meeting NAEYC standards for child/staff ratio is consistent with other studies of programs based upon data collected directly from providers (Kisker et al. 1991).

The relationship between control variables and whether programs met state or professional standards tended to be in the expected directions. For example, regional variation in the percentage of programs meeting state and NAEYC standards reflects known differences in licensing standards across states.

This attempt to evaluate program quality uses parent reports to analyze the relationship between characteristics of children and their families and characteristics of the programs in which they are enrolled. Parents are not perfect reporters of this information, as our analysis (Appendix A) shows, and such reports are measured with error. However, the fact that we have reasonable results for several control variables (age of child, region, and race–ethnicity) lends credence to our efforts to tease out the relationship between characteristics of children and their families and the characteristics of their programs using parent reports of the latter. Unfortunately, the amount of variation in quality is small according to the measures used here: child/staff ratio and group size. The nature of the NHES, a telephone study of parents, obviously limits the ability to examine the issue of access to quality center-based programs. Clearly, more work on measuring quality and greater efforts to obtain information directly from providers are needed before strong conclusions can be drawn about differences in the quality of programs in which different groups are enrolled.

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Appendix A

Measuring the Quality of Early Childhood Programs

Introduction

The validity of the analysis of program quality rests on the assumption that parents of young children know and can accurately report certain characteristics of the programs in which their children are enrolled. More specifically, the analysis assumes that parents' reports of the numbers of children and adults in their child's group would match the numbers reported by program directors or that could be observed directly. In addition, the child/staff ratio calculated from the reports of parents would match that calculated from information supplied by the program directors. Fortunately, for a small sample of families, the National Child Care Survey (NCCS) obtained interviews with their family day care or center provider.[1] Consequently, we can examine the match between parent and provider reports of the key program variables of group size, child/staff ratio, and teacher training. We were particularly interested in determining whether disadvantaged families differed from advantaged families in the consistency of parent and provider reports.

The 1990 National Child Care Survey was a nationally representative survey of 4,400 households with children under age 13 conducted between October 1989 and June 1990. The survey collected detailed information about child care arrangements and enrollments of children in a variety of preschool and before- and after-school programs. In addition, 1,356 parents whose youngest child (the reference child) was cared for in a child care center (578) or family day care home (778) on a regular basis were asked to provide the telephone number of their provider (Hofferth et al 1991), and an interview was obtained with the provider where possible. This resulted in a matched sample of 250 children (108 using family day care and 142 using day care centers) for whom information about their main child care arrangement was gathered from both their parents and their child care providers.

Slightly over half (56 percent) of parents of children enrolled in a center and 44 percent of parents of children enrolled in a family day care home gave the telephone number of their provider. However, not all the providers for whom telephone numbers were obtained were actually reachable and eligible for interview: 58 percent of centers (190) and 43 percent of family day care homes (147) were reached and determined to be eligible. A nonworking or wrong telephone number was the reason for centers being classified as ineligible. For family day care homes, in contrast, three-quarters of the numbers classified as ineligible were a result of the provider not (or no longer) providing care, and one-quarter were the result of nonworking or wrong numbers.

Once the NCCS arrived at a population of providers, response rates were relatively good—74 percent for family day care homes and 75 percent for center providers. However, of the original sample, interviews were obtained with only 25 percent of the center-based arrangements and only about 14 percent of the family day care arrangements.

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[1]While enrollments in family day care homes were not examined in the main body of this report, the NHES:91 asked parents about the characteristics of their family day care provider. Consequently, the validity of parent reports on family day care is an important subject for NCES.

Because of the small sample size, analysis was not restricted to parents of 3- to 5-year-old preschool children and their programs. Ages of children ranged from 0–9 in centers and 0–11 in family day care. However, the mean age was 2.5 in family day care and 3.3 in centers. Consequently, we would not expect the results to be substantially different if only 3- through 5-year-olds were selected for analysis.

In this analysis we assume that information from the provider is more accurate than information from the parent; no observations were made at the site of the care setting in order to obtain independent verification of the information reported by center directors or family day care providers. Recent evidence suggests that providers do not necessarily offer a more favorable report than would be obtained through the use of observational techniques. According to an analysis of data from the Child Care Staffing Study (a five-site study of day care centers) center director-reported and observational data on group size and child/staff ratios were highly correlated; correlations ranged from .48 to .80. Differences were not consistent, however. Director-reported data provided a worse portrait of infant and preschool staffing but a more favorable portrait of toddler staffing than observation data (Phillips et al. 1992, 21). These findings suggest that providers do not attempt to provide a more favorable picture than would be obtained from observation, and that their report can serve as a reasonable benchmark for the evaluation of parent reports.

Because group size, child/staff ratio, number of staff, and training of teachers are continuous variables, we use statistical techniques appropriate for interval scale variables. We also take advantage of the fact that we have a sample of pairs of reports from parents and providers. We will use two different bivariate techniques to examine the difference in reports from providers and parents. We then proceed to multivariate regression analysis. We describe these techniques in the following paragraphs.

Paired Comparisons Difference of Means t test

We first conduct a paired comparisons difference of means *t* test, which involves obtaining a difference score for each pair of provider-parent reports, and testing the null hypothesis of no difference in reports between the two populations (Wilkinson, 1990).

Cohen's Kappa

In family day care the range of measures of group size, number of staff, training of provider, and child/staff ratio is small. Consequently, they can be treated as categorical rather than continuous measures and use a measure developed specifically for such comparisons. We first examine the tables produced by tabulating parental and provider reports of group size, education/training of provider and number of staff. If the two were in perfect agreement, all the responses would fall on the diagonal. The measure of association, Cohen's Kappa, is a commonly used measure of inter-rater agreement that measures the degree to which the congruence of two responses is greater than the level expected by chance alone (Cohen 1960). It is constructed as the ratio of the difference between the observed number of cases in agreement and the expected number of cases in agreement to the difference between the total sample size and the expected number of cases in agreement. Its size is judged by using an asymptotic standard error to construct a confidence interval. The value of Kappa ranges from 0 to 1. Values of Kappa greater

than .75 are said to indicate strong agreement; between .40 and .75, fair to good; and below .40, poor agreement (Wilkinson 1990: p. 511).

Multivariate Regression

We start from the assumption that we will most often have parent data; rarely will we have provider data. Yet what we really want to know is how parent data can be used to obtain estimates of characteristics that would be better-reported by the center director or family day care provider. Consequently, director or provider reports constitute the left-hand-side or dependent variable in a model with parent data and control variables as right-hand-side or independent variables:

$$C_i = B_0 + B_1P_i + B_2X_i + E$$

where:

C_i= center director/provider report of the quality measure for child i's program;
P_i= parent report of the quality measure for program of child i;
X_i= control variables and risk factors for child i;
E= error of estimate.

The null hypothesis is not that the association (B_1) between parent and provider reports is 0, but that it is 1, i.e., that parent and center director data are the same (B_1=1). If we reject the hypothesis that they are equivalent, we then test the null hypothesis of no association between P and C (B_1=0). They may be highly associated even though they are not the same.

The other variables in the model represent the same control variables discussed in the main report—age of child, maternal employment, urbanicity, and region of residence[2]—and the same risk factors—poor, black or Hispanic race–ethnicity, single parent, large household size, low maternal education, young age when first became a mother, and child in fair or poor health.[3] These variables were added to the model containing the parent report, and those not significantly related to the provider report were dropped. The null hypothesis for these other variables is that B_2=0. Then each risk factor was added one at a time to see whether it explained additional variance. Those risk factors that were significantly related to the provider report were retained in the model. Finally, interactions between these risk factors and the parent report were tested for statistical significance.

Outline of the Appendix

In this appendix we describe how parent and provider reports of group size, number of staff, child/staff ratio, and training of teachers were measured, the simple bivariate association

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[2]All these children lived with their mothers, so "presence of mother in household" did not need to be included.

[3]Poor health of the child was substituted for disabling condition, which was not available. The variable was coded 1=fair or 0=poor. Language spoken in the home was also not available. The other variables were measured as were the variables in the NHES:91.

between the two reports, and the association between parent and provider reports in multivariate models adjusting for other factors. Parent-provider correspondence is separately evaluated for family day care homes and for day care centers.

Family Day Care

Measurement of Program Characteristics

Group Size

In family day care, group size is simply the number of children the provider cares for together. In the NCCS provider survey, providers were first asked to give the number of children in their care other than their own children or children who lived with them. Later in the survey they were asked the number of their own children whom they cared for at the same time. For providers, we calculated the total number of children cared for by summing the number of their own and other children in their care at the same time. The total number of children excluding the provider's own children was simply the response to the first question.

In the NCCS parent survey, parents were first asked for the total number of children the provider cares for and then were asked whether this includes any of the provider's children, and the number of such children. For parents the total number of children including the provider's own children was obtained from the first question and total children excluding the provider's own children was obtained by subtracting the number of provider's own children reported from total children cared for together.

Since group size was asked somewhat differently of parents and providers, the way the questions were asked might affect the degree of correspondence between the two different reports. We suspected that the measures based upon parents' reporting *all* children cared for would match most closely to the sum of provider's own children and day care children cared for, as reported by the provider. However, if parents only counted day care children in their first response, then their report would most closely match that of the provider's report not including their own children.[4] The four measures of group size and child/staff ratio (including and excluding the provider's own children as reported by parents, and including and excluding the provider's own children as reported by provider) give us four possible contrasts: (1) parent includes, provider includes own children; (2) parent includes, provider excludes own children; (3) parent excludes, provider includes own children; and (4) parent excludes, provider excludes own children.

In fact, preliminary analysis suggested that the best matches were of the parent report of total children and either of the two provider measures. Subtracting the number of the provider's own children from the parent report did not give a very good match, either because the parent did not include children of the provider to begin with or because these children might not all be cared for at the same time (i.e., some might be in school). Consequently, while we examined all four comparisons for group size, we focused only on two of the four different comparisons for

[4]The first question did not specifically ask parents to include the children of the provider.

child/staff ratio: (1) parent includes all children, provider does not; and (2) parent includes all children as does the provider.

Child/Staff Ratio

Both parents and providers were asked whether the provider has others who help her care for children. For both parents and providers the number of staff in family day care consists of the sum of the provider plus adult helpers. Four measures of child/staff ratio in family day care were calculated by dividing each of the measures of group size by the number of providers plus helpers.

Teacher Training

Providers who reported that they had special child care or early education training are said to have had training. Parents also reported whether their provider had received education or training specifically related to young children such as early childhood education or child psychology.

Bivariate Results

Group Size. The bivariate results support the hypothesis that *parents are good reporters of the number of children in the family day care home.* The reports corresponded best when both parents and providers included the provider's children or when parent reports included the children of the provider and provider reports did not. In the bivariate analysis (table A1), the mean difference in group size was minimized and the association maximized when parents reported total children and the provider reported only day care children, not her own. In this case, the mean difference (.069) was not significant and Cohen's Kappa was .507, suggesting a good degree of fit between the two reports.

Child/Staff Ratio. Based upon the first measure (parent yes and provider yes), the mean difference in child/staff ratio was large and statistically significant, with a Kappa in the poor range. Although the fit was better for the second measure (parent yes and provider no) with the mean difference in child/staff ratio small (.101) and nonsignificant, Cohen's Kappa (.217) suggested a poor degree of fit. There is no reason to expect similar results since the two measures are different; the *t* test does not capture directional differences, just size differences. Cohen's Kappa adjusts for correspondence that may occur due to chance. These results also suggest that, unless explicitly included in the question, parents may not tend to include the provider's children when reporting on the children the provider cares for.

Table A1—Correspondence between parent and provider reports: Family day care

Variable	Does group size include provider's own children?				Group size not relevant
	Parent, yes provider, yes	Parent, yes provider, no	Parent, no provider, yes	Parent, no provider, no	
Group size					
Mean difference	.806	.069	1.233	.500	
Probability	.003	.775	.000	.025	
Cohen Kappa	.470	.507	.336	.456	
Probability	good	good	poor	good	
N	103	102	103	102	
Child/staff ratio					
Mean difference	.807	.101	—	—	
Probability	.001	.634	—	—	
Cohen Kappa	.238	.217	—	—	
Probability	poor	poor			
N	102	102			
Training					
Mean difference	na	na	na	na	-.093
Probability					.229
Cohen Kappa					.365
Probability					poor
N					*54
Helpers					
Mean difference	na	na	na	na	-.038
Probability					.396
Cohen Kappa					.098
Probability					poor
N					106

*Due to survey error, this question was not asked of all family day care providers.

SOURCE: National Child Care Survey 1990.

Training. The *t* test for correspondence between reports of parents and providers regarding the training of the provider indicates a nonsignificant difference. However, the small size of Cohen's Kappa suggests that the correspondence is poor.

Number of Staff. The difference of means *t* test between parent and provider reports of number of staff is also nonsignificant. Again, however, Cohen's Kappa suggests that the level of correspondence is poor.

In sum, the correspondence between parent and provider reports is highly dependent upon the particular measures compared. Bivariate results obtained comparing parent and provider reports support the hypothesis that *if the appropriate comparisons are made, parents can be shown to be good reporters of the number of children in the family day care home.* Mean

differences were small, and the measure of correspondence (Cohen Kappa) was in the good range. However, it is important to control for other factors that affect child/staff ratios, since they may also affect how well parents report.

Multivariate Results

Correspondence Between Parent and Provider Reports

Group Size. The multiple regression findings are similar to those obtained through bivariate methods, suggesting that when parents report all children and the provider either includes or excludes her own children, there is a good fit between parent and provider reports of group size. The coefficient for parent report is highest and, therefore, the parent-provider fit is highest, when both included the provider's children in the count (table A2). In this case we cannot reject the null hypothesis that the coefficient of the parent report on provider's report of group size is 1 (i.e., that the two reports are identical). The model explains over half of the variance in the providers' reports of group size. In contrast to the bivariate results, this suggests that parents do tend to include provider's children in group size when they are not explicitly excluded by the question.

Child/Staff Ratio. Parent and provider reports of child/staff ratio are not equal, although their correspondence is very high and statistically greater than 0 for both measures of child/staff ratio.

Training. Due to a survey design error, sample sizes were too small to model the correspondence in reported provider training for parents and providers.

Number of Staff. There was too little variation to model number of staff in a multivariate framework.

Variation in Correspondence by Income

Low-income parents did not report larger group sizes in family day care than higher income parents. However, the interaction between poverty status and parent report was statistically significant, suggesting that the fit between parent and provider reports varied by income. The association between parent report and provider report of group size was significantly lower for poor families than for non-poor families. No other risk factor had a significant effect on the fit between parent and provider reports.

While in the same direction as for group size, the coefficient for the interaction of poverty and parent report on provider report of child/staff ratio was not statistically significant.

Health of the Child

Finally, children in poor health were in smaller family day care homes than children in good health. Although large in all models, this coefficient was statistically significant only for child/staff ratio and only when both parent and provider included the provider's children in their reports. This suggests that such children are in higher quality programs.

Table A2—Coefficients from the OLS regression of group size and child/staff ratio reported by providers on parents' reports and child characteristics: Family day care

	Parent and provider both include provider's children			
Independent variable	Group size	se	Child/staff ratio	se
Constant	[3]1.471	0.370	[3]1.640	0.334
Parent report	[3]0.841	0.082	[3,4]0.761	0.083
Family is poor	2.437	1.445	0.677	1.254
Poor x parent report	[2]-0.574	0.202	-0.239	0.199
Child in fair/poor health	-3.335	1.736	[1]-3.184	1.570
R^2	0.537		0.503	
N	101		100	

	Parent includes provider's children, provider does not			
Independent variable	Group size	se	Child/staff ratio	se
Constant	[1]0.855	0.333	[3]1.086	0.294
Parent report	[3,4]0.809	0.074	[3,4]0.714	0.073
Family is poor	1.091	1.301	-0.468	1.107
Poor x parent report	[1]-0.455	0.182	-0.123	0.175
Child in fair/poor health	-2.591	1.563	-2.442	1.386
R^2	0.571		0.538	
N	100		100	

[1]Coefficient significantly different from 0, p<.05.
[2]Coefficient significantly different from 0, p<.01.
[3]Coefficient significantly different from 0, p<.001.
[4]Coefficient is significantly different from 1, p<.05.

SOURCE: National Child Care Survey 1990.

Conclusion

We conclude that parents were good reporters of group size in family day care, though income affected this relationship. The correspondence between reports of child/staff ratio was smaller, which was expected since this involves two different reports, that of group size and number of helpers, and the correspondence between reports of helpers was low.

Day Care Centers

Measurement of Center Characteristics

Group Size

The center director was asked about the number of children enrolled in each group in the center, and the parent was asked about the number of children in the child's group or class. Because group size varies by age of child, and we did not ask the center director specifically about the actual group in which the reference (youngest) child was enrolled, we assigned the average size of comparable age groups of children as the center director report. Preliminary analyses showed a large difference between parent and provider reports of the number of children in the child's group, with parent reports much lower than the center director's. Because of absenteeism, which averages about 10 percent, parents see fewer children than are actually enrolled; thus parents are likely to consistently report fewer children in a group than are center directors. In fact, from the point of view of the child, attendance should be a better measure of group size than enrollment. In order to explore whether absenteeism explained initial differences in reports, two measures of group size (group size adjusted and not adjusted for absenteeism) were created. Besides enrollment, the center directors were asked to estimate the number of children absent each day. These reports were converted to a rate of absenteeism and applied to the group or class in which the child was enrolled, with the assumption that absenteeism is roughly equal over all classrooms.

Child/Staff Ratio

Group size and number of teachers are the two components of child/staff ratio. In center-based care our measure of staff included teachers, assistant teachers, and aides caring for children in age groups comparable to that of the reference child. For both parents and center directors, the child/staff ratio was calculated for either the child's group or a group of children of comparable age by dividing the number of children in the group by the number of staff members caring for them.

Teacher Training

Parents were asked whether the person responsible for caring for their youngest child had received education or training specifically related to young children, such as in early childhood education or child psychology. If center directors reported that any of the teachers in the center received 10 hours or more of child-related training in the last year, the child's teacher was said to be trained. By this measure, only one teacher, perhaps not even the child's teacher, had to have training; thus this measure is not expected to be very similar to the parent report except that it is likely that staff will tend to be homogeneous with regard to training. In addition, center staff tend to be highly likely to have had some training (Kisker et al. 1991).

Bivariate Results

Parent and provider reports of *group size* differed by 4.6 children, with parent reports lower than that of the center director, a difference which is statistically significant (table A3).

Adjusted for absenteeism, this difference was reduced to 3.1 children, but is still statistically significant. The mean difference in *child/staff ratio* was 2.5, also significant; however, adjusting for absenteeism reduced the mean difference between parent and provider reports of child/staff ratio to 0. The mean difference in *number of staff* was statistically significant while the mean difference in *training* was not. This suggests that parents do a fair job of guessing whether their child's teacher or center staff have had some training but may not do so well in determining the number of teachers in the classroom. However, these findings need to be examined controlling for other factors.

Table A3—Correspondence between parent and provider reports: Day care centers

Variable	Is group size adjusted for absenteeism?	
	Not adjusted	Adjusted
Group size		
Mean difference	4.6	3.1
Probability	.000	.001
N	125	125
Child/staff ratio		
Mean difference	2.5	-.013
Probability	.000	.976
N	128	123
Training		
Mean difference	na	-.017
Probability		.707
N		116
Number of teachers		
Mean difference	na	.551
Probability		.001
N		122

SOURCE: National Child Care Survey 1990.

Multivariate Regression Results

Correspondence Between Parent and Provider Reports

Group Size. In the regression results (table A4), the coefficient for parent report on the provider report of *group size* was statistically different from 1, both correcting and not correcting for absenteeism. The coefficient was significantly different from 0 and the overall proportion of variance explained was high (almost 50 percent), with the coefficient on parent report adjusted for absenteeism somewhat larger in size than the coefficient in the model not so adjusted. Consequently, while parent reports of group size were strongly associated with provider reports, the reports were not identical.

Table A4—Coefficients from OLS regressions of group size and child/staff ratio reported by providers on parents' reports and child characteristics: Day care centers

Independent variable	Provider-reported group size: Not adjusted for absenteeism	se	Provider-reported group size: Adjusted for absenteeism	se
Constant	1.501	2.455	-.178	2.304
Parent report	[1,4]0.290	0.130	[1,4]0.309	0.122
Age of child	[2]1.895	0.579	[2]1.914	0.543
Size of center	[3]0.060	0.015	[3]0.059	0.014
Work status of mother	-1.210	2.884	-2.353	2.707
Center size x work status	[2]0.070	0.025	[2]0.077	0.023
R^2	0.459		0.499	
N	121		121	

Independent variable	Provider-reported child/staff ratio: Not adjusted for absenteeism	se	Provider-reported child/staff ratio: Adjusted for absenteeism	se
Constant	[1]3.183	1.367	2.285	0.294
Parent report	[4]0.128	0.128	[4]0.153	0.122
Age of child	[1]0.710	0.294	0.484	0.298
Size of center	[2]0.027	0.008	[1]0.017	0.008
Work status of mother	1.590	1.486	0.500	1.432
Center size x work status	-.007	0.013	-.005	.013
R^2	0.168		0.133	
N	124		120	

[1]Coefficient significantly different from 0, p<.05.
[2]Coefficient significantly different from 0, p<.01.
[3]Coefficient significantly different from 0, p<.001.
[4]Coefficient significantly different from 1, p<.05.

Child/Staff Ratio. The coefficient for the relationship between parent and provider report of child/staff ratio was small and not statistically different from 0. Consequently, calculation of child/staff ratio from parent reports are not good measures of child/staff ratio calculated from provider reports. This may be because there are two separate sources of error in reporting—error in group size and error in number of staff.

Number of Staff. The parent report for number of staff was statistically different from both 1 and 0 (table A5). Thus, while parent reports of the number of staff are similar to those of center directors, they are far from perfect, thus contributing to the weaker relationship between child/staff ratios calculated from parents' and providers' reports of children and staff, described above.

Teacher Training. Finally, while reports of training corresponded fairly closely using the *t* test for paired comparisons ($p>.05$), the coefficient for parent report of training of teachers was both significantly different from 1 and not different from 0 in the multivariate analysis (table A5). The two measures of training of teachers used here are not related. This is very likely because we do not have a measure of the training of the child's actual teacher with which to compare the parental report. Of greater concern, the results show that providers of care for the children of employed mothers were less likely to report that a teacher was trained than were the providers of care for the children of nonemployed mothers.

Table A5—Coefficients from OLS regressions of number and training of teachers reported by providers on parents' reports and child characteristics: Day care centers

Independent variable	Number of teachers	se
Constant	[1]1.131	0.534
Parent report	[1,4]0.291	0.134
Age of child	0.102	0.110
Size of center	[1]0.007	0.003
Work status of mother	-.834	0.589
Center size * work status	[1]0.012	0.005
R2	0.230	
N	118	
Independent variable	**Training of teachers**	**se**
Constant	[3]1.042	0.125
Parent report	[4]-.043	0.088
Age of child	-.028	0.022
Size of center	0.000	0.001
Work status of mother	[3]-.416	0.113
Center size * work status	10.002	0.001
R^2	0.188	
N	112	

[1]Coefficient significantly different from 0, $p<.05$.
[2]Coefficient significantly different from 0, $p<.01$.
[3]Coefficient significantly different from 0, $p<.001$.
[4]Coefficient significantly different from 1, $p<.05$.

This suggests that programs for employed mothers are not as good on this measure of quality as programs for children of nonemployed mothers. This is similar to findings reported

earlier that programs for children in middle-income families were less likely to meet state and NAEYC standards for child/staff ratio than those of children in high-income families.

Other Variables

The age of the child, the size of the center, and the interaction between the size of the center and the work status of the mother were important factors affecting the center-director report of the size of the group, after controlling for the parent report. Older children were in larger groups. Group sizes were larger in larger centers.[5] While employed mothers placed their children in centers with smaller group sizes than nonemployed mothers, this pattern was not found for larger centers. That is, as center size rose, the differential in provider-reported group size between children of employed and nonemployed mothers declined significantly.

Neither family income nor poverty status was associated with director reports of center characteristics, nor was there any indication that low-income parents were less accurate reporters of these variables than wealthier parents.

Summary

Both bivariate and regression-based analyses suggest that while parent and provider reports of center characteristics such as group size and number of staff were associated, the reports were not identical. The measure of training used here was not adequate to test the correspondence between parent and provider reports. Child/staff ratios calculated from parent and provider reports of number of children and number of staff were not associated, net of other factors.

Conclusions

Parents are better able to determine the characteristics of small home-based settings such as family day care homes than large formal settings such as day care centers. While size per se may be important, the closeness of the relationship between provider and parent and the intimacy of the setting may be just as important. It should be noted that no statistically significant interaction between the parent report and the size of the program in centers was identified. Rather, this speculation is based upon the different degree of correspondence of parent-provider reports for family day care homes and centers.

What do these results say about the confidence we can place in the reports of parents about their center-based programs? Do they call into question our findings about quality that stem from parent reports? They do not call into question findings based upon parental reports of group size. While the coefficient for the relationship between parent and provider report of

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[5]An examination of the residuals suggests that the assumption of homoscedasticity of the disturbances is violated. The larger the size of the group, the larger the residuals. This problem is reduced somewhat by controlling for the size of the center itself. As center size increases, group sizes increase, and the fit of the model declines. Weighting by the inverse of the size of the center produced results identical to those controlling for center size. Consequently, the final models control for center size.

group size was not 1, neither was it 0. It was, in fact, statistically different from 0 at $p<.05$. In addition, the full model explained about half of the variance in provider reports; it is therefore a very good model compared with most such models. So these findings should not be construed as a rejection of parent reports of group size. However, the association between parent and provider reports of number of staff was somewhat weaker, contributing to the lack of a relationship between staff/child ratios calculated from parent and provider reports.

The degree of correspondence between parent and provider reports depended upon how questions were worded. For example, parent reports of the total number of children paired with provider reports including their own children showed the closest correspondence. This suggests that greater attention to question wording could improve parent reports of key provider characteristics. Greater attention to actual or experiential versus theoretical characteristics also helps. For example, adjusting provider reports for absenteeism greatly improved the correspondence between parent and provider reports of group size in centers. Characteristics of parents also affected the correspondence between parent and provider reports, and this could be taken into consideration in interpreting the results. Finally, a substantial number of parents' reports differed greatly from the provider reports. It is not hard to imagine settings in which the size of the group would be ambiguous, such as programs with open classrooms. In spite of question wording, it is likely that some parents reported on the entire program rather than the group in which the child spends his time. In addition, the parent and provider may be reporting on different groups of children; the director was not asked specifically about the reference child's group.

While it may be discouraging that the parents were not as good reporters of the characteristics of their children's center-based programs as of their family day homes, from the perspective of future surveys this is actually an encouraging result. Experience shows that it is considerably easier to obtain this information from the directors of formal center-based programs (who generally undergo inspection and review for licensing or regulation purposes) than from informal ones (most of whom are neither licensed nor regulated) (see Hofferth et al. 1991; Willer et al. 1991). Consequently, this finding suggests a strategy for future research of continuing to obtain information on informal settings from parents while supplementing the data collection by going directly to program directors for information on formal group settings.

Appendix B

Technical Notes and Methodology

Data Source—National Household Education Survey

NHES:91 is a random digit dial (RDD) telephone survey conducted for NCES by Westat, Inc. The survey was conducted with a sample drawn from the noninstitutionalized civilian population in households with telephones in the 50 states and the District of Columbia from late January through early May of 1991. Computer-assisted telephone interviewing (CATI) technology was used to conduct the survey. NHES:91 included two components: an Early Childhood Education (ECE) survey of the parents of children from 3 to 8 years old, and an Adult Education (AE) survey of persons 16 years of age and older. This report pertains only to the ECE survey component.[1]

All children from 2 to 9 years old were enumerated in each sampled household, and the appropriate respondent for the ECE survey was identified for each child. The appropriate respondent was defined as the parent or guardian who knew the most about the child's care and education. About 78 percent of the respondents were the child's mother; another 18 percent were the child's father; and the remaining 4 percent were other persons such as grandparents, stepparents, or guardians, with stepmothers and grandparents being the most common respondents among this latter group.

The respondent was asked the month and year of the child's birth. This information was used to calculate the child's age on January 1, 1991, which was used as the primary criterion for final eligibility. Children who were 3 to 8 years old on January 1 were included in the survey. All children who were 9 years old on January 1 and had not yet completed second grade were also included, so that accurate retention rates could be calculated for second graders.

Since the sample was drawn from the noninstitutional population of 3- to 8-year-olds in households with telephones, the estimates were adjusted so that the totals were consistent with the total number of persons in all (telephone and nontelephone) households. The independent estimates were taken from the March 1991 CPS control totals of number of persons by race and age. The distributions of numbers of persons by income, home ownership status, and census region from the October 1990 CPS were also used to adjust the estimates.

Survey Content

Following determination of eligibility based on the child's month and year of birth, data were collected on household composition, the child's parents' marital status, and the child's school enrollment status. At this stage, the interview took either a preprimary path for children not yet enrolled in first grade, or a primary school path for children enrolled in first grade or above. Items for preprimary children included: a) current nonparental care and early education arrangements, including care by relatives or nonrelatives, participation in day care centers, and enrollment in nursery schools, prekindergartens, and Head Start programs; b) information on planned or current kindergarten enrollment; c) a series of items on the home environment,

[1]Additional information pertaining to the ECE survey component is provided in the *NHES:91 Preprimary and Primary Data Files User's Manual* (Brick et al., 1992).

including activities with family members; d) child's birth weight and handicap status; and e) family status variables (i.e., family income, parental education, and labor force status).

Data Reliability

Estimates produced using data from surveys are subject to two types of error, sampling and nonsampling. Sampling error occurs because the data are collected from a sample rather than a census of the population. Nonsampling errors occur during the collection and processing of data.

Nonsampling Errors

Nonsampling error refers to variations in estimates which may be caused by coverage, data collection, processing, and reporting procedures. The sources of nonsampling errors typically include: a) unit and item nonresponse, b) differences in respondents' interpretation of the meaning of the questions, c) response differences related to the particular time the survey was conducted, and c) mistakes in data preparation.

In general, it is difficult to identify and estimate either the amount of nonsampling error or the bias caused by this error. In the NHES:91 data collection, efforts were made to prevent nonsampling errors from occurring, and to compensate for them where possible. For instance, in an effort to check for consistency of interpretation of items, and to eliminate ambiguity in items during the survey design phase, cognitive laboratories and focus groups, over 500 hours of CATI instrument testing, and a pretest with over 200 households were used.

A reinterview program was included in the NHES:91 in order to examine the impact of measurement errors on estimates of the characteristics of children's early education experience (Brick and West 1992). The reinterview program was designed to identify specific items that were not reliable, to quantify the response variance for groups of items, and to provide feedback for future administrations of the NHES. The reinterview program included the items that asked parents about their children's attendance at day care centers, nursery schools and other center-based programs. These items were found to have small to moderate measurement error depending on the statistic that is used to assess item performance.

A specific issue that readers should be aware of is the ambiguity associated with describing and classifying center-based programs for children. The results of the survey suggest that some respondents (about 128) provided duplicate reports of daycare center and nursery school participation. That is, they reported that their child was enrolled in both types of programs, but reported the same number of hours and days per week, with the total hours summing to 50 or more. These are presumed to be duplicate counts, and have been unduplicated by using information from the screener for the purposes of this report. Additional information on this matter is provided in the *NHES:91 Preprimary and Primary Data Files User's Manual* (Brick et al., 1992).

A source of nonsampling error for a telephone survey is the failure to include persons who do not live in households with telephones. Based on data from the October 1990 CPS, it is estimated that about 90 percent of all 3- to 8-year-olds live in households with telephones.

Estimation procedures were used to adjust for bias in the estimates associated with the undercoverage. Additional information on nonresponse coverage issues and a detailed presentation of the results of the types of adjustments made for field test appear in the report "Telephone Undercoverage Bias of 14- to 21-year-olds and 3- to 5-year-olds" (Brick and Burke, 1992).

Sampling Errors

The sample of telephone households selected for NHES:91 is just one of the many possible samples of telephone households that could have been selected. Thus, estimates produced from the NHES:91 sample may differ from estimates that would have been produced from other samples. This type of variability is called sampling error because it arises from using a sample of persons (or households), rather than all persons (or households). The standard error is a measure of the variability due to sampling when estimating a statistic such as a population total or a percentage. For each statistic, it indicates how much variance there is in the population of possible estimates for a given sample size. Standard errors can be used as a measure of the precision expected from a particular sample. The probability that a statistic from a complete census would differ from the sample statistic by less than one standard error is about 68 out of 100. The chances that the difference would be less than 1.65 times the standard error are about 90 out of 100; and that the difference would be less than 1.96 times the standard error, about 95 out of 100.

Even though the NHES:91 used random digit dialing methods to select the survey sample, the direct estimates of sampling errors for the estimates cannot be based on the assumptions of simple random sampling. Various factors, including oversampling to improve estimates of blacks and Hispanics, clustering of sampled persons within households, the use of the modified Waksberg approach, and nonlinear estimation procedures, all contribute to deviations from simple random sampling.

One method used for computing sampling errors to reflect these aspects of the sample design and the estimation procedures is called jackknife replication. In this method, the sample is divided into groups of replicates based upon the original sample of phone numbers. A replicate weight is developed for each replicate sample using the same procedures used for the full sample. This procedure is repeated for each replicate.

Estimates are then produced for each replicate using the replicate weights and are compared to the full sample estimate in order to estimate the sampling error of the statistic. The computation of the replicate estimates, comparison to the full sample estimate, and the computation of the estimated sampling error for the statistic was done using the SAS software REPTAB, option JK1.

Response Rates

NHES:91 completed screening interviews with 60,314 households. The weighted response rate for the screening of households was an estimated 81.1 percent.

A total of 13,892 interviews were completed for children who were sampled and identified as eligible for the ECE component of the survey. The weighted completion rate for the ECE interview, or the percent of interviews conducted for eligible children, was 94.5 percent. The sample included 7,655 completed preprimary interviews and 6,237 completed primary interviews. The overall weighted response rate for the ECE interview was 77 percent, the product of the household screening response rate and the ECE interview completion rate.

For the NHES:91 ECE component, the item response rate (the number of completed data items divided by the number of items that could have been completed) is in excess of 95 percent for nearly every item.

Variables Used[2]

Classification variables were created to describe the characteristics of children, their mothers, and their families. These variables were then examined in relation to several outcome variables, including whether a child was enrolled in kindergarten or in a daycare or preschool program; if he or she was enrolled, whether enrolled on a full-time or part-time basis; and if the program in which the child was enrolled for the greatest amount of time per week met the standards set by the National Association for the Education of Young Children (NAEYC) or by the state in which the family resided regarding the maximum group size and child/staff ratio in early childhood programs for children of that child's age.

Due to differences in the kinds of variables required for the computation of various statistics, some of these variables were defined in multiple categories for the bivariate analyses and then dichotomized for the multivariate analyses (logistic regressions). The section below describes the variables used in both types of analyses. The names of variables that were used as they existed on the file are in upper case type, and the names of variables that were created for these analyses from variables given on the file are presented in upper case type and in parentheses.

Weights

The final child weight, EWGT, was used in producing the data presented in tables 1-5 in Appendix C. This weight was normalized in the logistic regression analyses.

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[2]For detailed information about all the variables in the NHES data file consult U.S. Department of Education, National Center for Education Statistics, *National Household Education Survey of 1991: Preprimary and Primary Data Files User's Manual*, 1992 (Washington, D.C.).

Family Characteristics

(HOUSEINC)

Household Income (HOUSEINC) was constructed from INCOMRNG as follows:

1 = $15,000 or less	INCOMRNG = 1, 2, or 3
2 = $15,001-$25,000	INCOMRNG = 4 or 5
3 = $25,001-$30,000	INCOMRNG = 6
4 = $30,001-$50,000	INCOMRNG = 7 or 8
5 = more than $50,000	INCOMRNG = 9 or 10

(POVERTY)

Children's families were classified as poor or not poor using criteria for size and income published by Congress (Committee on Ways and Means 1992, 1272) and data from NHES on household income and the number of persons living in the household. The poverty thresholds for households of various sizes are as follows:

2 people	$ 8,880
3 people	$10,873
4 people	$13,942
5 people	$16,481
6 people	$18,617
7 or more people	$21,124

Using these thresholds, (POVERTY) was constructed from the NHES variables INCOMRNG and NUMPERS. INCOMRNG represented the range within which a household's annual income fell, and NUMPERS represented the number of people, adults and children, who lived in the household. (POVERTY) was created from these two variables as follows:

0 = At or above line	INCOMRNG = $20,001 or greater; OR INCOMRNG = $10,001-$15,000 and NUMPERS < 4; OR INCOMRNG = $15,001-$20,000 and NUMPERS < 6
1 = Below poverty line	INCOMRNG = $10,000 or less; OR INCOMRNG = $10,001-$15,000 and NUMPERS ≥ 4; OR INCOMRNG = $15,001-$20,000 and NUMPERS ≥ 6

(HOMELANG)

Home language (HOMELANG) was constructed from MOMLANG (mother's first language) and MOMSPEAK (language mother spoke most at home) as follows:

0 = English	MOMLANG = English or MOMSPEAK = English
1 = Not English	MOMSPEAK = Spanish, or an Asian or other language

FAMTYPE

Family composition used FAMTYPE as follows:

1 = One parent
2 = Two parents

(PARDICH)

Family composition was dichotomized by recoding FAMTYPE as follows:

0 = 2 parents	FAMTYPE = 2
1 = 0 or 1 parent	FAMTYPE = 1 or 3

(NOHSEHLD)

Household size (NOHSEHLD) was constructed from NUMPERS (number of people living in household) as follows:

1 = Two or three	NUMPERS = 2 or 3
2 = Four	NUMPERS = 4
3 = Five	NUMPERS = 5
4 = Six or more	NUMPERS ≥ 6

(NOHODICH)

Household size was dichotomized (NOHODICH) by recoding NOHSEHLD as follows:

0 = 5 or fewer members	NOHSEHLD = 1, 2, or 3
1 = 6 or more members	NOHSEHLD = 4

CENSUSRG

Region used CENSUSRG as follows:
1 = Northeast
2 = Midwest
3 = South
4 = West

URBAN

Urbanicity used URBAN as follows:

0 = non-Metropolitan Statistical Area[3]
1 = Metropolitan Statistical Area

Mother Characteristics

(MOMED)

Mother's education (MOMED) was constructed from MOMGRADE (highest grade completed by mother) as follows:

1 = Less than high school	MOMGRADE = eleventh grade or less
2 = High school or equivalent	MOMGRADE = high school diploma, equivalent, or vocational/technical education after high school
3 = Some college	MOMGRADE = associate's degree or 1-4 years of college without bachelor's degree
4 = College or graduate school	MOMGRADE = bachelor's degree or graduate school

(MOMEDICH)

Mother's education (MOMEDICH) was dichotomized as follows:

0 = At least high school diploma or GED	MOMED = 2, 3, or 4
1 = Did not complete high school or earn GED	MOMED = 1

TEENMOM

Mother's age at first becoming a parent used TEENMOM as follows:

1 = Less than 18
2 = 18-19
3 = 20 and over

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[3]Metropolitan Statistical Areas are defined by the Office of Management and Budget for use in the presentation of statistics by agencies of the Federal Government. An MSA is a geographical area consisting of a large population nucleus, together with adjacent communities which have a high degree of economic and social integration with that nucleus.

(MAGEDICH)

Mother's age at first becoming a parent was dichotomized by recoding TEENMOM as follows:[4]

0 = 18 or older	TEENMOM = 2 or 3
1 = Younger than 18	TEENMOM = 1

MOMEMPLD

Mother's work status used MOMEMPLD as follows:

1 = 35 hours per week or more
2 = Less than 35 hours per week
4 = Looking for work
5 = Not in labor force

MWORKST

Mother's work status was dichotomized using MOMEMPLD as follows:

0 = MOMEMPLD = 4 or 5
1 = MOMEMPLD = 1 or 2

Child Characteristics

AGE90

Children's age was determined using the variable AGE90, which represented the age of the child as of January 1, 1991, and was calculated from the child's birth month and year as reported by the respondent.

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[4]Mothers 18 or older are more likely to have graduated from high school or received a GED, and are more likely to have been married when they first became parents. Consequently, children of mothers who were 18 when they first became parents are not at as great a risk as children whose mothers were younger than 18 when they first became parents (see, for example, Hofferth & Moore 1979). Therefore, only children whose mothers were less than 18 years old when they first became parents were counted as being at risk in the dichotomized variable.

(RACEETHY)

Two NHES questions concerning children's racial–ethnic backgrounds were combined to create one race–ethnicity variable that distinguished among various minority groups. Race–ethnicity (RACEETHY) was constructed from HISPANIC and RACE as follows:

1 = White, non-Hispanic	HISPANIC = no and RACE = white
2 = Black, non-Hispanic	HISPANIC = no and RACE = black
3 = Asian/Pacific Islander	HISPANIC = no and RACE = Asian/Pacific Islander
4 = Other	HISPANIC = no and RACE = Native American, Alaskan Native, or some other race
5 = Hispanic	HISPANIC = yes

(RACEDICH)

Race–ethnicity was dichotomized (RACEDICH) by recoding RACEETHY as follows:

0 = White, non-Hispanic; Asian/ Pacific Islander, or Other	RACEETHY = 1, 3, or 4
1 = Black, non-Hispanic or Hispanic	RACEETHY = 2 or 5

(DISDICH)

Disabling conditioon was dichotomized (DISDICH) using HANDICAP as follows:

0 = None	HANDICAP = No
1 = One or more	HANDICAP = Yes

(RISKFACT)

The risk factor summary (RISKFACT) was constructed from the following variables: (DISDICH), (HOMELANG), (MAGEDICH), (MOMEDICH), (NOHODICH), (PARDICH), (POVERTY), and (RACEDICH). For each case, RISKFACT was computed by summing the individual's values for each of the 8 variables listed above. Thus the variable could take on values ranging from 0 to 8, and in fact took on values ranging from 0 to 7. In cases where children were not living with their mothers or stepmothers, RISKFACT had a maximum value of 5. These children had missing values for the variables that required data about their mothers or stepmothers, (HOMELANG), (MOMEDICH), and (MAGEDICH).)

Outcome Variables

Enrollment Variables

(ANYENROL)

Enrollment in either kindergarten or a center-based preschool program (ANYENROL) was constructed from ENROLL, DAYCARE, and PREKNURS as follows:

1 = enrolled in kindergarten or program	Child is enrolled in school (ENROLL = 1) or is preschool enrolled in a daycare or prekindergarten/nursery s c h o o l program (DAYCARE or PREKNURS = 1)
0 = not enrolled in kindergarten or a preschool program	(ANYENROL) does not equal 1

(FULLDAY)

Enrollment in a full-day center-based preschool program (FULLDAY) was constructed as follows:[5]

1 = enrolled in a full-day preschool program	Any of programs that child attends is a full-day program (DAYCPRG1, DAYCPRG2, DAYCPRG3, PREKPRG1, PREKPRG2, PREKPRG3, or PREKPRG4 = 1)
0 = not enrolled in a full-day preschool program	None of programs that child attends is a full-day program (DAYCPRG1, DAYCPRG2, DAYCPRG3, PREKPRG1, PREKPRG2, PREKPRG3, and PREKPRG4 ≠ 1)

(KINDER)

Enrollment in kindergarten (KINDER) was constructed from ENROLL, GRADE, and GRADEEQ as follows:

1 = enrolled in kindergarten	Child is enrolled in kindergarten, transitional kindergarten, or pre-first/transitional first grade {ENROLL = 1 and [(GRADE = K or T or P) or (GRADEEQ = K or T or P)]}
0 = not enrolled in kindergarten	KINDER does not equal 1

[5]Note that this variable was only used in analyses of children who were not enrolled in kindergarten and were enrolled in a preschool program, using the definitions of these enrollments as given above.

(PROGRAM)

Enrollment in a center-based preschool program (PROGRAM) was constructed from DAYCARE and PREKNURS as follows:[6]

1 = enrolled in preschool	Child is enrolled in a daycare or preschool/nursery school program (DAYCARE or PREKNURS = 1)
0 = not enrolled in preschool	(PROGRAM) does not equal 1

Program Quality Variables

Some children participated in more than one center-based preschool program. Eighteen children attended more than one daycare center and 39 children attended more than one prekindergarten or nursery school program. In addition, 357 children attended one daycare program and one prekindergarten or nursery school program. To accommodate the children who attended multiple programs, the variables used to describe the quality of the programs in which children were enrolled—(GRPSZSTD), (NAEGRPSD), (NAEYCSTD), and (STRATSTD)—were created by first identifying the program in which a child spent the most time, and then creating variables that described the characteristics of that program. These variables—(MOSTHRS), (MOSTKID), (MOSTADL), AND (MOSTRAT)—are described below.

(MOSTHRS)	Daycare or prekindergarten/nursery school program in which child spent the most time. If child attends two programs with same number of hours, choose first of the programs in alphanumeric order (e.g., DAYCHRS3 before PREKHRS2).
(MOSTKID)	Number of children who attended the program in which the child spent the most time (i.e., program described in (MOSTHRS)).
(MOSTADL)	Number of adults who cared for or taught children in the program in which child spent the most time (i.e., program described in (MOSTHRS))
(MOSTRAT)	Ratio of (MOSTKID) / (MOSTADL)

[6]Note that this variable was only used in analyses of children who were not enrolled in kindergarten, with kindergarten enrollment defined as given above.

(GRPSZSTD)

Whether the program in which the child spent the most time per week met the standard in his state of residence for maximum group size (GRPSZSTD) was constructed from the following variables: (MOSTKID), State (FIPS codes), and AGE90. State standards were obtained from Morgan (1992).

. (missing)	State does not equal AL, CT, DC, IL, KS, MA, MD, MN, NC, NJ, NY, OH, OK, OR, RI, SD, TN, TX, UT, VT, WA, WI; or missing on AGE90 or (MOSTKID)
1 = Met standard	State = AL, AGE90 = 3, and (MOSTKID) ≤ 12; State = AL, AGE90 = 4 or 5, and (MOSTKID) ≤ 20; State = CT or IL or MN or NJ or SD or TN or VT or WA, and (MOSTKID) ≤ 20 State = DC, AGE90 = 3, and (MOSTKID) ≤ 16; State = DC, AGE90 = 4, and (MOSTKID) ≤ 20; State = DC, AGE90 = 5, and (MOSTKID) ≤ 25; State = KS, AGE90 = 3 or 4, and (MOSTKID) ≤ 24; State = KS, AGE = 5, and (MOSTKID) ≤ 28; State = MA, age = 3 or 4, and (MOSTKID) ≤ 20; State = MA, AGE90 = 5, and (MOSTKID) ≤ 30; State = MD, AGE90 = 3 or 4, and (MOSTKID) ≤ 20; State = MD, AGE90 = 5, and (MOSTKID) ≤ 26; State = NC and (MOSTKID) ≤ 25; State = NY, AGE90 = 3, and (MOSTKID) ≤ 18; State = NY, AGE90 = 4, and (MOSTKID) ≤ 21; State = NY, AGE90 = 5, and (MOSTKID) ≤ 24; State = OH, AGE90 = 3, and (MOSTKID) ≤ 24; State = OH, AGE90 = 4 or 5, and (MOSTKID) ≤ 28; State = OK, AGE90 = 3, and (MOSTKID) ≤ 24; State = OK, AGE90 = 4 or 5, and (MOSTKID) ≤ 30; State = OR, AGE90 = 3 or 4, and (MOSTKID) ≤ 20; State = OR, AGE90 = 5, and (MOSTKID) ≤ 30; State = RI, AGE90 = 3, and (MOSTKID) ≤ 15; State = RI, AGE90 = 4, and (MOSTKID) ≤ 20; State = RI, AGE90 = 5, and (MOSTKID) ≤ 25; State = TX and (MOSTKID) ≤ 35; State = UT and (MOSTKID) ≤ 25; State = WI, AGE90 = 3, and (MOSTKID) ≤ 20; State = WI, AGE90 = 4, and (MOSTKID) ≤ 24; State = WI, AGE90 = 5, and (MOSTKID) ≤ 32.
0 = Did not meet standard	State = AL, CT, DC, IL, KS, MA, MD, MN, NC, NJ, NY, OH, OK, OR, RI, SD, TN, TX, UT, VT, WA, WI, and combination of AGE90 and (MOSTKID) does not meet above conditions.

(NAEYCSTD)

Whether the program in which the child spent the most time per week met the NAEYC standard for maximum child/staff ratio (NAEYCSTD) was constructed from (MOSTRAT) as follows:

1 = Met standard	(MOSTRAT) ≤ 10
0 = Did not meet standard	(MOSTRAT) > 10

(NAEGRPD)

Whether the program in which the child spent the most time per week met the NAEYC standard for maximum group size (NAEGRPD) was constructed from (MOSTKID) as follows:

1 = Met standard	(MOSTKID) ≤ 20
0 = Did not meet standard	(MOSTKID) > 20

(STRATSTD)

Whether the program in which the child spent the most time per week met the standard for maximum child/staff ratio (STRATSTD) in his state of residence was constructed from the following variables: State, AGE90, and (MOSTRAT)

. (missing)	missing on any of State, AGE90, or (MOSTRAT);
1 = Met standard	State = AK, AGE90 = 3 or 4, and (MOSTRAT) ≤ 10; State = AK, AGE90 = 5, and (MOSTRAT) ≤ 15; State = AL, AGE90 = 3, and (MOSTRAT) ≤ 12; State = AL, AGE90 = 4 or 5, and (MOSTRAT) ≤ 20; State = AR, AGE90 = 3, and (MOSTRAT) ≤ 12; State = AR, AGE90 = 4, and (MOSTRAT) ≤ 15; State = AR, AGE90 = 5, and (MOSTRAT) ≤ 18; State = AZ, AGE90 = 3, and (MOSTRAT) ≤ 13; State = AZ, AGE90 = 4, and (MOSTRAT) ≤ 15; State = AZ, AGE90 = 5, and (MOSTRAT) ≤ 25; State = CA and (MOSTRAT) ≤ 12; State = CO, AGE90 = 3, and (MOSTRAT) ≤ 10; State = CO, AGE90 = 4, and (MOSTRAT) ≤ 12; State = CO, AGE90 = 5, and (MOSTRAT) ≤ 15; State = CT and (MOSTRAT) ≤ 10; State = DC, AGE90 = 3, and (MOSTRAT) ≤ 8; State = DC, AGE90 = 4, and (MOSTRAT) ≤ 10; State = DC, AGE90 = 5, and (MOSTRAT) ≤ 15; State = DE, AGE90 = 3, and (MOSTRAT) ≤ 12; State = DE, AGE90 = 4, and (MOSTRAT) ≤ 15; State = DE, AGE90 = 5, and (MOSTRAT) ≤ 25; State = FL, AGE90 = 3, and (MOSTRAT) ≤ 15; State = FL, AGE90 = 4, and (MOSTRAT) ≤ 20;

State = FL, AGE90 = 5, and (MOSTRAT) ≤ 25;
State = GA, AGE90 = 3, and (MOSTRAT) ≤ 12;
State = GA, AGE90 = 4, and (MOSTRAT) ≤ 18;
State = GA, AGE90 = 5, and (MOSTRAT) ≤ 20;
State = HI, AGE90 = 3, and (MOSTRAT) ≤ 12;
State = HI, AGE90 = 4, and (MOSTRAT) = 16;
State = HI, AGE90 = 5, and (MOSTRAT) ≤ 20;
State = IA, AGE90 = 3, and (MOSTRAT) ≤ 8;
State = IA, AGE90 = 4, and (MOSTRAT) ≤ 12;
State = IA, AGE90 = 5, and (MOSTRAT) ≤ 15;
State = ID, AGE90 = 3, and (MOSTRAT) ≤ 10;
State = ID, AGE90 = 4 or 5, and (MOSTRAT) = 15;
State = IL, AGE90 = 3 or 4, and (MOSTRAT) ≤ 10;
State = IL, AGE90 = 5, and (MOSTRAT) ≤ 20;
State = IN, AGE90 = 3, and (MOSTRAT) ≤ 10;
State = IN, AGE90 = 4, and (MOSTRAT) ≤ 12;
State = IN, AGE90 = 5, and (MOSTRAT) ≤ 15;
State = KS, AGE90 = 3 or 4, and (MOSTRAT) ≤ 12;
State = KS, AGE90 = 5, and (MOSTRAT) ≤ 14;
State = KY, AGE90 = 3, and (MOSTRAT) ≤ 12;
State = KY, AGE90 = 4, and (MOSTRAT) ≤ 14;
State = KY, AGE90 = 5, and (MOSTRAT) ≤ 15;
State = LA, AGE90 = 3, and (MOSTRAT) ≤ 14;
State = LA, AGE90 = 4, and (MOSTRAT) ≤ 16;
State = LA, AGE90 = 5, and (MOSTRAT) ≤ 20;
State = MA, AGE90 = 3 or 4, and (MOSTRAT) ≤ 10;
State = MA, AGE90 = 5, and (MOSTRAT) ≤ 15;
State = MD, AGE90 = 3 or 4, and (MOSTRAT) ≤ 10;
State = MD, AGE90 = 5, and (MOSTRAT) ≤ 13;
State = ME and (MOSTRAT) ≤ 10;
State = MI, AGE90 = 3, and (MOSTRAT) ≤ 10;
State = MI, AGE90 = 4 or 5, and (MOSTRAT) ≤ 12;
State = MN and (MOSTRAT) ≤ 10;
State = MO, AGE90 = 3 or 4, and (MOSTRAT) ≤ 10;
State = MO, AGE90 = 5, and (MOSTRAT) ≤ 16;
State = MS, AGE90 = 3, and (MOSTRAT) ≤ 14;
State = MS, AGE90 = 4, and (MOSTRAT) ≤ 16;
State = MS, AGE90 = 5, and (MOSTRAT) ≤ 20;
State = MT, AGE90 = 3, and (MOSTRAT) ≤ 8;
State = MT, AGE90 = 4 or 5, and (MOSTRAT) ≤ 10;
State = NC, AGE90 = 3, and (MOSTRAT) ≤ 14;
State = NC, AGE90 = 4, and (MOSTRAT) ≤ 19;
State = NC, AGE90 = 5, and (MOSTRAT) ≤ 24;
State = ND, AGE90 = 3, and (MOSTRAT) ≤ 7;
State = ND, AGE90 = 4, and (MOSTRAT) ≤ 10;
State = ND, AGE90 = 5, and (MOSTRAT) ≤ 12;
State = NE, AGE90 = 3, and (MOSTRAT) ≤ 10;

State = NE, AGE90 = 4 or 5, and (MOSTRAT) ≤ 12;
State = NH, AGE90 = 3, and (MOSTRAT) ≤ 8;
State = NH, AGE90 = 4, and (MOSTRAT) ≤ 12;
State = NH, AGE90 = 5, and (MOSTRAT) ≤ 15;
State = NJ, AGE90 = 3, and (MOSTRAT) ≤ 10;
State = NJ, AGE90 = 4 or 5, and (MOSTRAT) ≤ 15;
State = NM, AGE90 = 3 or 4, and (MOSTRAT) ≤ 12;
State = NM, AGE90 = 5, and (MOSTRAT) ≤ 15;
State = NV and (MOSTRAT) ≤ 13;
State = NY, AGE90 = 3, and (MOSTRAT) ≤ 7;
State = NY, AGE90 = 4, and (MOSTRAT) ≤ 8;
State = NY, AGE90 = 5, and (MOSTRAT) ≤ 9;
State = OH, AGE90 = 3, and (MOSTRAT) ≤ 12;
State = OH, AGE90 = 4 or 5, and (MOSTRAT) ≤ 14;
State = OK, AGE90 = 3, and (MOSTRAT) ≤ 12;
State = OK, AGE90 = 4 or 5, and (MOSTRAT) ≤ 15;
State = OR, AGE90 = 3 or 4; and (MOSTRAT) ≤ 10;
State = OR, AGE90 = 5, and (MOSTRAT) ≤ 15;
State = PA and (MOSTRAT) ≤ 10;
State = RI, AGE90 = 3, and (MOSTRAT) ≤ 15;
State = RI, AGE90 = 4, and (MOSTRAT) ≤ 20;
State = RI, AGE90 = 5, and (MOSTRAT) ≤ 25;
State = SC, AGE90 = 3, and (MOSTRAT) ≤ 15;
State = SC, AGE90 = 4, and (MOSTRAT) ≤ 20;
State = SC, AGE90 = 5, and (MOSTRAT) ≤ 25;
State = SD and (MOSTRAT) ≤ 10;
State = TN, AGE90 = 3, and (MOSTRAT) ≤ 10;
State = TN, AGE90 = 4, and (MOSTRAT) ≤ 15;
State = TN, AGE90 = 5, and (MOSTRAT) ≤ 20;
State = TX, AGE90 = 3, and (MOSTRAT) ≤ 17;
State = TX, AGE90 = 4, and (MOSTRAT) ≤ 20;
State = TX, AGE90 = 5, and (MOSTRAT) ≤ 24;
State = UT, AGE90 = 3 or 4; and (MOSTRAT) ≤ 15;
State = UT, AGE90 = 5, and (MOSTRAT) ≤ 20;
State = VA, AGE90 = 3, and (MOSTRAT) ≤ 10;
State = VA, AGE90 = 4 or 5, and (MOSTRAT) ≤ 12;
State = VT and (MOSTRAT) ≤ 10;
State = WA and (MOSTRAT) ≤ 10;
State = WI, AGE90 = 3, and (MOSTRAT) ≤ 10;
State = WI, AGE90 = 4, and (MOSTRAT) ≤ 13;
State = WI, AGE90 = 5, and (MOSTRAT) ≤ 17;
State = WV, AGE90 = 3, and (MOSTRAT) ≤ 10;
State = WV, AGE90 = 4, and (MOSTRAT) ≤ 12;
State = WV, AGE90 = 5, and (MOSTRAT) ≤ 15;
State = WY, AGE90 = 3, and (MOSTRAT) ≤ 10;
State = WY, AGE90 = 4, and (MOSTRAT) ≤ 15;
State = WY, AGE90 = 5, and (MOSTRAT) ≤ 20;

0 = Did not meet standard (STRATSTD) does not equal 1.

METHODOLOGY

The statistics reported in Tables 1–2, 4–5, 16, and C1–C6 represent the proportions of children that fell within particular categories. For example, Table 2 shows that 42.3 percent of 3-year-olds and 60.4 percent of 4-year-olds were enrolled in early childhood programs. These proportions can also be expressed relative to each other as an odds ratio.

This ratio can be calculated in the following manner:

1. The proportion of 3-year-olds who were enrolled in early childhood programs = 0.423; odds = 0.423/(1-0.423) = 0.733. The proportion of 4-year-olds who were enrolled = 0.604; odds = 0.604/(1-0.604) = 1.526.

2. The odds ratio of 3-year-olds versus 4-year-olds = 0.733/1.526 = 0.481.

In simple terms this means that being 3 years old rather than 4 years old decreases a child's odds of being enrolled in an early childhood program by a factor of .48—or, in other words, 3-year-olds are about 52 percent less likely than 4-year-olds to be enrolled.

One can also use logistic regression to calculate these odds ratios. The logistic model is generally written in terms of the odds in the following manner:

$$\log\left[\frac{\text{Prob(event)}}{\text{Prob(no event)}}\right] = B_0 + B_1X_1 + \ldots + B_pX_p$$

or alternatively:

$$\frac{\text{Prob(event)}}{\text{Prob(no event)}} = e^{B_0 + B_1X_1 + \ldots + B_pX_p}$$

For example, using logistic regression one can regress enrollment in early childhood programs on being 3 years old (coded 1,0). This model can be written as:

$$\frac{\text{Prob(enrollment)}}{\text{Prob(nonenrollment)}} = e^{B_0 + B_{age}}$$

Fitting this model with a logistic regression program and adjusting the standard errors of the regression coefficients to account for the complex sampling design of NHES results in:

Variable	B	S.E.	Wald statistic (t test)	Significance
Constant	0.423	0.051	8.29	<0.001
3 years old	-0.734	0.071	10.34	<0.001

The odds ratio for the comparison of 3-year-olds to 4-year-olds for enrollment is calculated by:

$$\hat{\Psi} = e^{-0.734} = 0.480$$

or approximately the same odds ratio calculated above. The significance of this odds ratio is identical to the significance of the t test for the B coefficient upon which it is based.

Obviously, using logistic regression to calculate these simple odds ratios is not an efficient procedure. However, using logistic regression, one can also calculate the odds ratios for comparisons *controlling for other variables*. The statistics in Tables 3, 6–15, and 17 are the odds ratios of enrollment in an early childhood program that have been adjusted for various other variables, such as household income, race–ethnicity, and mother's work status, that are likely to be related to children's enrollment. For example, in table 3 the model has been expanded to be:

$$\frac{\text{Prob(enrollment)}}{\text{Prob(nonenrollment)}} = e^{B_0+B_{age3}+B_{age5}+B_{emp.mom}+B_{urban}+B_{NE}+B_{Central}+B_{West}+B_{No\ mom}}$$

where $B_{age\ 3}$, $B_{age\ 5}$, etc., are dummy-coded variables with 4-year-olds, children with nonemployed mothers, children who live in nonurban areas, children who live in the South, and children whose mothers live with them as reference groups, respectively. The results of this model are as follows:

Variable	B	S.E.	Wald statistic (t test)	Significance
Constant	0.446	0.096	4.64	<0.001
Age				
3 years versus 4 years	-0.741	0.072	10.29	<0.001
5 years versus 4 years	0.210	0.111	1.89	n.s.
Mother employed versus not employed	-0.586	0.069	8.49	<0.001
Urban versus nonurban	0.353	0.081	4.36	<0.001
Northeast versus South	0.107	0.099	1.08	n.s.
Central versus South	-0.071	0.089	0.80	n.s.
West versus South	-0.192	0.092	2.09	<0.05
No mother in household versus mother in household	-0.396	0.218	1.815	n.s.

Data Source—National Child Care Survey 1990

The National Child Care Survey 1990 (NCCS) is a telephone survey designed by the Urban Institute and conducted by Abt Associates for the National Association for the Education of Young Children and the Administration for Children, Youth and Families. The survey was conducted with a sample representative of all civilian, non-institutionalized persons in the 50 states and the District of Columbia between October 1989 and June 1990. Data were collected using a random-digit-dialing (RDD) method commonly referred to as the Mitofsky-Waksberg method and computer-assisted telephone interviewing (CATI) technology.

A household screener was administered to an adult member of the household to determine whether any children under the age of 13 lived in the household. If so, an interview was conducted with the person most knowledgeable about the care of children younger than age 13 in the household. About 90 percent of the respondents were the child's mother. Data were collected for each such child, but more detailed data were collected for the youngest child under age 13.

Response Rates

The NCCS completed screeners with 39,331 households, of which 6,333 contained at least one child younger than age 13. The response rate for the screener was 83 percent. The completion rate for the basic child care interview was 69 percent of the eligible households screened. Thus, the overall response rate for the basic interview was 57 percent (the product of the screener response rate and the interview completion rate). While lower than expected, the response rate does not appear to have affected the resulting estimates. Analyses of the 1991 National Household Education Survey, which had high response rates, indicate similar estimates for center enrollments for 3- through 5-year-olds (West, Hausken, and Collins, 1993).

Weighting

Since the sample was drawn from the population of households with a telephone, the estimates were adjusted so that the totals were consistent with the total number of telephone and nontelephone households. Based upon the 1989 Current Population Survey, weights were computed that adjust for differential response rates as well as differential coverage rates due to households without telephones. NCCS results compare favorably with those from the Survey of Income and Program Participation, suggesting no systematic differences between responding and non-responding households.

Matched Sample of Parents and Providers

Parents who used either a center-based program or family day care were asked to provide the telephone numbers of their main provider for their youngest child and Abt Associates contacted and interviewed about 250 of these by telephone. This resulted in a matched sample of 142 center-based providers and parents and 108 family day care providers and parents.

Response Rates

As others have found (e.g., Louis Harris and Associates, 1987), obtaining the telephone numbers of providers from parents and then obtaining the cooperation of providers is not easy. Telephone numbers were obtained for about half of providers (44 percent of family day care providers, 56 percent of centers). This difficulty was expected. However, when interviewers actually contacted providers, about half said that they were not providing care. Consequently, while interviews were obtained from about 74 percent of eligible providers, the sample sizes were much smaller than expected. As a consequence, the extent of bias of the matched sample of parents and providers is unknown. However, the major interest in the study is how closely parent and provider reports match; and there is no reason to suspect that the distribution of correspondence between parent and provider reports based upon this sample will differ from that based upon a different sample, even though the level of the characteristics may differ.

Based upon an examination of the joint distribution of parent and provider scores, there were only three outliers in the family day care sample. Two of these were corrected using other information in the survey. The third appeared to be in error and the parent and provider estimates of group size were assigned missing values. The joint distribution of parent and provider reports of group size in the center-based provider sample was examined and ten outliers were deleted from the sample, reducing the analysis sample. While this improved the fit of the models, a number of less serious outliers remained.

Survey Content

Besides basic demographic and labor force information on all household members, parents were asked detailed information about the programs in which their children were enrolled and then about the characteristics of these programs, including group size, number of teachers or staff, and the training of the provider. Family day care providers were asked for detailed information about themselves and their programs. Detailed questions on number, age, relationship to the provider of children and helpers, and the provider's own education and training were asked. Center directors were asked detailed questions about the number, size, age structure, and staffing of groups and about the education and training of teachers.

Appendix C

Tables

Table C1a— Number of children, number of preschool children,* and percentage of preschool children enrolled in center-based programs, by age and selected demographic characteristics: 1991

	3-year-olds			4-year-olds			5-year-olds		
	Number of children	Number of pre-schoolers	Percent pre-schoolers enrolled	Number of children	Number of pre-schoolers	Percent pre-schoolers enrolled	Number of children	Number of pre-schoolers	Percent pre-schoolers enrolled
Total	3,764,659	3,748,891	42.3	3,762,909	3,635,695	60.4	3,674,728	1,043,619	63.8
s.e.	0.2	5,311.6	1.43	1,039.6	14,073.5	1.04	10,303.4	38,870.9	2.10
unwtd. n	2,251	2,240	2,240	2,303	2,216	2,215	2,346	635	634
Household income									
$15,000 or less	978,248	976,525	33.7	931,187	903,413	51.0	984,651	283,352	61.8
s.e.	46,722.3	46,296.4	3.14	33,540.5	33,652.6	2.72	43,325.0	30,817.4	5.81
unwtd. n	391	390	390	410	396	396	410	111	111
$15,001–$25,000	727,703	723,408	32.6	694,948	667,290	51.7	667,352	207,169	58.5
s.e.	38,037.4	37,562.0	2.66	27,185.5	26,205.3	3.01	31,290.4	20,567.6	4.67
unwtd. n	406	403	403	385	368	368	408	118	117
$25,001–$30,000	380,407	379,961	33.4	400,215	381,504	54.9	422,573	120,498	55.9
s.e.	23,884.0	23,648.2	3.33	23,130.9	23,505.5	3.19	23,174.5	13,735.4	6.10
unwtd. n	273	272	272	283	269	268	302	84	84
$30,001–$50,000	966,767	961,943	46.0	1,067,852	1,033,097	62.4	929,176	259,657	67.5
s.e.	33,887.9	33,249.2	2.16	38,468.9	37,286.7	1.62	36,269.5	16,843.7	3.22
unwtd. n	683	680	680	748	721	721	718	194	194
$50,001 or more	711,534	707,054	63.7	668,708	650,392	82.5	670,976	172,943	73.3
s.e.	32,058.4	31,81.0	2.33	34,314.0	33,976.6	1.98	25,409.2	13,423.0	4.39
unwtd. n	498	495	495	477	462	462	508	128	128

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Table C1a— Number of children, number of preschool children,* and percentage of preschool children enrolled in center-based programs, by age and selected demographic characteristics: 1991—Continued

	3-year-olds			4-year-olds			5-year-olds		
	Number of children	Number of pre-schoolers	Percent pre-schoolers enrolled	Number of children	Number of pre-schoolers	Percent pre-schoolers enrolled	Number of children	Number of pre-schoolers	Percent pre-schoolers enrolled
Poverty status									
Below poverty line	952,452	950,728	32.9	906,723	877,525	51.7	961,685	289,624	61.4
s.e.	49,663.3	49,112.6	2.95	30,813.0	31,128.9	2.74	43,618.6	31,081.6	5.61
unwtd. n	384	383	383	395	381	381	405	114	114
At or above poverty line	2,812,207	2,798,163	45.5	2,856,186	2,758,171	63.2	2,713,043	753,994	64.7
s.e.	49,663.3	49,791.3	1.45	30,872.9	34,942.9	1.13	41,421.7	27,994.9	2.14
unwtd. n	1,867	1,857	1,857	1,908	1,835	1,834	1,941	521	520
Race–ethnicity									
Asian–Pacific Islander	77,511	77,511	48.9	56,404	54,773	65.3	64,910	—	—
s.e.	11,820.7	11,820.7	8.59	10,596.7	10,185.4	10.90	11,577.8	—	—
unwtd. n	56	56	56	40	39	39	48	9	9
Black, non-Hispanic	609,449	607,726	45.0	534,731	499,650	69.7	540,690	131,899	75.4
s.e.	34,423.7	34,086.8	4.18	31,362.2	28,953.9	3.79	30,498.2	20,088.6	5.82
unwtd. n	290	289	289	272	252	252	287	60	60
Hispanic	436,109	435,662	24.9	457,095	445,698	50.5	461,390	120,889	46.3
s.e.	25,447.8	25,386.2	3.19	24,630.5	24,057.4	3.91	25,038.2	16,484.7	8.46
unwtd. n	270	269	269	284	275	275	284	62	62
White, non-Hispanic	2,555,025	2,541,427	44.5	2,652,964	2,574,851	60.3	2,531,142	751,122	64.4
s.e.	46,453.0	45,580.9	1.55	34,527.4	34,569.6	1.23	39,342.4	28,954.6	2.06
unwtd. n	1,584	1,575	1,575	1,665	1,609	1,608	1,683	494	493
Other	86,565	86,565	39.1	61,715	60,723	59.2	76,596	—	—
s.e.	18,311.2	18,311.2	8.68	9,246.7	9,340.1	9.91	16,814.1	—	—
unwtd. n	51	51	51	42	41	41	44	10	10

Table C1a— Number of children, number of preschool children,* and percentage of preschool children enrolled in center-based programs, by age and selected demographic characteristics: 1991—Continued

	3-year-olds			4-year-olds			5-year-olds		
	Number of children	Number of preschoolers	Percent preschoolers enrolled	Number of children	Number of preschoolers	Percent preschoolers enrolled	Number of children	Number of preschoolers	Percent preschoolers enrolled
Home language									
English	3,375,458	3,366,530	44.1	3,424,931	3,319,982	60.8	3,293,204	969,007	64.5
s.e.	27,976.0	27,733.3	1.47	24,014.2	26,610.3	1.11	26,496.7	39,345.3	2.17
unwtd. n	2,021	2,014	2,014	2,100	2,027	2,026	2,119	595	594
Not English	287,446	285,462	25.9	227,294	217,169	50.9	258,170	—	—
s.e.	24,420.4	24,400.5	4.33	22,129.2	20,845.9	4.38	18,762.0	—	—
unwtd. n	174	173	173	138	131	131	155	26	26
Family composition									
One parent	820,171	814,105	40.8	771,821	733,394	54.7	844,835	236,803	68.3
s.e.	40,430.3	40,488.1	2.88	34,955.5	33,066.7	2.71	44,550.8	21,745.1	5.37
unwtd. n	394	390	390	402	379	379	453	114	114
Two parents	2,918,483	2,908,781	42.9	2,959,524	2,877,083	62.0	2,800,235	803,230	62.6
s.e.	39,653.7	41,173.3	1.46	35,457.9	35,220.7	1.20	46,297.6	37,262.1	2.39
unwtd. n	1,841	1,834	1,834	1,882	1,822	1,821	1,874	518	517
Household size									
Two or three members	907,122	900,728	51.2	729,917	709,905	67.0	771,834	195,169	71.3
s.e.	33,485.7	32,417.2	2.64	37,624.6	36,711.6	2.82	44,072.8	23,039.2	4.33
unwtd. n	504	501	501	423	409	409	432	102	102
Four members	1,472,684	1,468,213	45.1	1,492,717	1,448,048	61.6	1,437,425	390,425	69.6
s.e.	38,950.2	38,818.3	2.17	45,227.1	45,953.4	1.65	47,504.3	21,733.4	3.19
unwtd. n	887	883	883	924	893	893	955	249	249
Five members	834,373	829,470	35.9	920,755	892,744	60.7	878,286	271,055	54.8
s.e.	38,140.1	38,277.8	2.10	41,985.7	41,830.2	2.14	50,270.8	29,568.3	5.31
unwtd. n	527	523	523	571	552	551	570	166	165
Six or more members	550,480	550,480	29.9	619,521	584,998	49.1	587,182	186,969	56.7
s.e.	32,106.9	32,106.9	2.77	39,596.7	38,145.1	2.90	35,236.6	18,738.6	4.94
unwtd. n	333	333	333	385	362	362	389	118	118

Table C1a— Number of children, number of preschool children,* and percentage of preschool children enrolled in center-based programs, by age and selected demographic characteristics: 1991—Continued

	3-year-olds			4-year-olds			5-year-olds		
	Number of children	Number of preschoolers	Percent preschoolers enrolled	Number of children	Number of preschoolers	Percent preschoolers enrolled	Number of children	Number of preschoolers	Percent preschoolers enrolled
Education of mother									
Less than high school	508,687	507,478	22.5	509,507	494,379	36.6	557,674	145,771	45.6
s.e.	34,384.0	34,621.4	2.75	33,542.4	32,994.7	3.49	40,723.6	17,621.0	6.48
unwtd. n	262	261	261	278	267	266	298	76	76
High school or GED	1,483,949	1,479,272	34.7	1,465,068	1,420,790	53.7	1,548,435	458,363	59.8
s.e.	46,201.7	45,977.1	1.98	52,589.6	51,835.4	2.03	40,188.6	29,223.2	3.29
unwtd. n	866	863	863	865	836	836	977	267	266
Some college	963,177	960,751	49.5	1,019,232	984,945	68.7	869,848	241,209	76.3
s.e.	40,918.4	40,594.8	2.23	38,573.3	36,655.6	1.89	33,095.2	19,350.4	3.64
unwtd. n	607	605	605	660	636	636	593	159	159
College or more	714,456	711,856	64.5	665,627	644,244	79.8	592,384	171,792	72.4
s.e.	34,712.3	34,350.9	2.30	32,325.9	32,375.2	1.89	28,925.5	16,881.1	5.58
unwtd. n	465	463	463	438	422	422	411	119	119
Age first became mother									
Younger than 18	324,663	323,454	32.7	417,748	396,948	46.7	366,100	124,234	54.2
s.e.	28,634.2	28,708.8	5.18	28,881.9	29,208.4	4.60	28,064.2	18,634.6	6.17
unwtd. n	160	159	159	207	196	196	202	61	61
18–19	546,345	544,621	30.2	485,962	481,153	47.2	574,722	157,826	55.5
s.e.	34,417.9	34,767.6	3.16	27,775.8	27,630.2	3.49	27,036.5	18,809.5	5.73
unwtd. n	299	298	298	283	280	280	346	88	87
20 or older	2,799,260	2,791,282	46.2	2,755,724	2,666,258	64.6	2,627,519	735,075	67.2
s.e.	47,422.7	47,119.4	1.55	35,736.8	36,527.4	1.24	40,231.9	32,825.8	2.37
unwtd. n	1,741	1,735	1,735	1,751	1,685	1,684	1,731	472	472

Table C1a— Number of children, number of preschool children,* and percentage of preschool children enrolled in center-based programs, by age and selected demographic characteristics: 1991—Continued

	3-year-olds			4-year-olds			5-year-olds		
	Number of children	Number of preschoolers	Percent preschoolers enrolled	Number of children	Number of preschoolers	Percent preschoolers enrolled	Number of children	Number of preschoolers	Percent preschoolers enrolled
Mother's employment status									
Not in labor force	1,400,978	1,397,169	34.5	1,245,548	1,210,188	52.8	1,321,402	402,416	59.6
s.e.	33,154.7	32,514.6	1.90	38,748.4	36,607.4	1.90	42,105.2	32,115.5	3.72
unwtd. n	808	805	805	754	730	730	794	236	235
Looking for work	214,019	214,019	32.4	245,951	235,825	50.8	229,043	68,611	46.9
s.e.	20,558.6	20,558.6	5.55	23,868.7	23,825.1	5.03	20,836.1	13,464.1	9.94
unwtd. n	105	105	105	127	120	120	124	34	34
Less than 35 hours per week	824,022	820,494	48.9	888,018	867,809	63.7	774,566	218,398	69.6
s.e.	40,230.9	40,318.0	2.37	38,271.2	38,789.7	2.85	33,793.2	17,029.4	4.28
unwtd. n	497	494	494	538	525	525	520	135	135
35 hours per week or more	1,231,250	1,227,675	49.5	1,279,917	1,230,537	66.8	1,243,330	327,709	68.6
s.e.	40,694.5	40,951.5	2.35	42,690.4	40,628.8	1.82	41,106.4	23,711.5	3.16
unwtd. n	790	788	788	822	786	785	841	216	216
Disabling condition									
None	3,642,410	3,626,642	42.1	3,577,123	3,457,613	60.2	3,478,925	976,407	62.7
s.e.	17,276.1	18,340.1	1.44	17,047.4	22,859.2	1.03	22,384.0	35,370.4	2.18
unwtd. n	2,175	2,164	2,164	2,189	2,109	2,108	2,223	598	597
One or more	122,249	122,249	48.9	185,786	178,083	65.0	195,803	67,211	78.9
s.e.	17,276.1	17,276.1	5.26	17,196.3	17,100.0	5.03	19,536.7	15,402.1	7.24
unwtd. n	76	76	76	114	107	107	123	37	37

Table C1a— Number of children, number of preschool children,* and percentage of preschool children enrolled in center-based programs, by age and selected demographic characteristics: 1991—Continued

	3-year-olds			4-year-olds			5-year-olds		
	Number of children	Number of preschoolers	Percent preschoolers enrolled	Number of children	Number of preschoolers	Percent preschoolers enrolled	Number of children	Number of preschoolers	Percent preschoolers enrolled
Risk factors									
None	1,564,277	1,558,283	49.2	1,594,077	1,550,406	67.3	1,420,971	399,501	66.4
s.e.	46,201.7	45,831.8	1.83	44,836.1	43,867.8	1.60	42,248.7	18,995.3	3.13
unwtd. n	1,044	1,039	1,039	1,068	1,033	1,033	1,014	283	282
One	936,580	930,186	43.6	918,954	892,216	59.1	939,859	284,299	63.7
s.e.	40,853.0	41,396.6	2.22	32,311.9	31,444.7	2.30	32,551.5	21,577.4	4.63
unwtd. n	586	583	583	580	562	561	646	182	182
Two or more	1,263,802	1,260,422	32.8	1,249,878	1,193,074	52.5	1,313,898	359,819	61.0
s.e.	45,844.2	45,507.6	2.57	34,612.1	31,169.8	2.24	45,725.3	28,720.6	3.71
unwtd. n	621	618	618	655	621	621	686	170	170

*"Preschool children" were defined as children ages 3–5 who were not enrolled in kindergarten.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Table C1b— Number of 3- to 5-year-old children, preschool children,* and percentage of preschool children enrolled in center-based programs, by selected demographic characteristics: 1991

	3- to 5-year-olds		
	Number of children	Number of pre-schoolers	Percent pre-schoolers enrolled
Total	11,202,296	8,428,205	52.8
s.e.	10,667.1	39,965.2	0.89
unwtd. n	6900	5091	5089
Household income			
$15,000 or less	2,894,086	2,163,290	44.6
s.e.	50,303.7	55,797.5	1.84
unwtd. n	1211	897	897
$15,001–$25,000	2,090,003	1,597,867	44.0
s.e.	51,190.5	46,517.0	1.94
unwtd. n	1199	889	888
$25,001–$30,000	1,203,195	881,962	45.7
s.e.	34,089.0	30,008.5	2.30
unwtd. n	858	625	624
$30,001–$50,000	2,963,794	2,254,697	56.0
s.e.	57,301.3	51,111.1	1.25
unwtd. n	2149	1595	1595
$50,001 or more	2,051,217	1,530,388	72.8
s.e.	60,789.6	56,879.4	1.54
unwtd. n	1483	1085	1085
Poverty status			
Below poverty line	2,820,860	2,117,877	44.6
s.e.	50,345.0	56,014.5	1.77
unwtd. n	1184	878	878
At or above line	8,381,436	6,310,328	55.5
s.e.	50,837.4	55,391.8	0.98
unwtd. n	5716	4213	4211
Race–ethnicity			
Asian–Pacific Islander	198,826	146,916	56.4
s.e.	24,138.8	19,005.5	5.76
unwtd. n	144	104	104
Black, non–Hispanic	1,684,870	1,239,275	58.2
s.e.	40,088.6	41,492.3	2.48
unwtd. n	849	601	601
Hispanic	1,354,594	1,002,250	38.9
s.e.	30,501.3	31,216.6	2.20
unwtd. n	838	606	606
White, non–Hispanic	7,739,130	5,867,400	54.0
s.e.	58,444.2	59,823.9	0.95
unwtd. n	4932	3678	3676
Other	224,876	172,364	50.5
s.e.	35,130.1	29,786.6	6.09
unwtd. n	137	102	102

Table C1b— Number of 3- to 5-year-old children, preschool children,* and percentage of preschool children enrolled in center-based programs, by selected demographic characteristics: 1991—Continued

	3- to 5-year-olds		
	Number of children	Number of pre-schoolers	Percent pre-schoolers enrolled
Home language			
English	10,093,593	7,655,519	53.9
s.e.	51,112.5	60,747.2	0.90
unwtd. n	6240	4636	4636
Not english	772,910	550,758	37.8
s.e.	39,253.8	31,288.7	2.89
unwtd. n	467	330	330
Family composition			
No parents	85,275	54,808	34.2
s.e.	14,684.4	10,237.1	9.71
unwtd. n	52	34	34
One parent	2,436,827	1,784,303	50.2
s.e.	71,024.0	60,084.8	2.17
unwtd. n	1249	883	883
Two parents	8,678,242	6,589,094	53.6
s.e.	72,973.0	67,461.1	0.92
unwtd. n	5597	4174	4172
Household size			
Two or three	2,408,872	1,805,803	59.6
s.e.	72,883.3	56,296.2	1.66
unwtd. n	1359	1012	1012
Four	4,402,826	3,306,686	55.2
s.e.	85,046.3	62,877.9	1.22
unwtd. n	2766	2025	2025
Five	2,633,414	1,993,269	49.6
s.e.	87,265.1	69,149.38	1.76
unwtd. n	1668	1241	1239
Six or more	1,757,183	1,322,448	42.2
s.e.	79,500.7	60,472.5	2.22
unwtd. n	1107	813	813

Table C1b— Number of 3- to 5-year-old children, preschool children,* and percentage of preschool children enrolled in center-based programs, by selected demographic characteristics: 1991—Continued

	3- to 5-year-olds		
	Number of children	Number of pre-schoolers	Percent pre-schoolers enrolled
Education of mother			
Lt high school	1,575,868	1,147,628	31.5
s.e.	74,111.6	54,833.9	2.07
unwtd. n	838	604	603
High school or GED	4,497,452	3,358,426	46.1
s.e.	75,101.4	70,231.4	1.37
unwtd. n	2708	1966	1965
Some college	2,852,257	2,186,905	61.1
s.e.	72,792.4	64,756.9	1.54
unwtd. n	1860	1400	1400
College or more	1,972,467	1,527,892	71.9
s.e.	59,829.9	51,881.8	1.54
unwtd. n	1314	1004	1004
Age first became mother			
Younger than 18	1,108,511	844,636	42.4
s.e.	53,796.6	49,168.3	3.49
unwtd. n	569	416	416
18-19	1,607,029	1,183,600	40.5
s.e.	56,051.6	49,967.4	2.41
unwtd. n	928	666	665
20 or older	8,182,504	6,192,615	56.6
s.e.	79,604.1	65,558.3	0.91
unwtd. n	5223	3892	3891
Mother's employment status			
Not in labor force	3,967,928	3,009,774	45.2
s.e.	79,108.2	66,302.1	1.17
unwtd. n	2356	1771	1770
Looking for work	689,013	518,455	42.7
s.e.	47,861.9	40,309.1	3.43
unwtd. n	356	259	259
Less than 35 hours per week	2,486,606	1,906,701	58.0
s.e.	68,448.5	62,197.6	1.64
unwtd. n	1555	1154	1154
35 hours per week or more	3,754,496	2,785,921	59.4
s.e.	80,659.3	65,881.4	1.32
unwtd. n	2453	1790	1789

Table C1b— Number of 3- to 5-year-old children, preschool children,* and percentage of preschool children enrolled in center-based programs, by selected demographic characteristics: 1991—Continued

	3-to 5-year-olds		
	Number of children	Number of pre-schoolers	Percent pre-schoolers enrolled
Disabling condition			
None	10,698,458	8,060,662	52.3
s.e.	34,910.6	42,812.9	0.91
unwtd. n	6587	4871	4869
One or more	503,838	367,543	62.2
s.e.	33,678.5	29,736.8	3.39
unwtd. n	313	220	220
Risk factors			
None	4,579,325	3,508,190	59.1
s.e.	65,936.9	61,657.1	1.2
unwtd. n	3126	2355	2354
One	2,795,393	2,106,701	52.3
s.e.	63,366.5	52,705.3	1.8
unwtd. n	1812	1327	1326
Two or more	3,827,578	2,813,315	44.8
s.e.	69,481.4	62,534.9	1.7
unwtd. n	1962	1409	1409

*"Preschool children" were defined as children ages 3–5 who were not enrolled in kindergarten.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Table C2— Percentage of children enrolled in center-based early childhood or kindergarten programs, by age, household income, and poverty status: 1991

	Percent 3-year-olds enrolled	Percent 4-year-olds enrolled	Percent 5-year-olds enrolled	Percent 3- to -5-year olds enrolled
Total	42.5	61.7	89.7	64.5
s.e.	1.41	1.00	0.75	0.67
unwtd. n	2,251	2,303	2,346	6,900
Household income				
$15,000 or less	33.9	52.5	89.0	58.6
s.e.	3.11	2.65	1.90	1.31
unwtd. n	391	410	410	1,211
$15,001–$25,000	33.0	53.7	87.2	57.2
s.e.	2.64	2.85	1.97	1.65
unwtd. n	406	385	408	1,199
$25,001–$30,000	33.5	56.8	87.4	60.2
s.e.	3.32	3.01	2.41	1.90
unwtd. n	273	283	302	858
$30,001–$50,000	46.3	63.6	90.9	66.5
s.e.	2.13	1.58	0.98	0.92
unwtd. n	683	748	718	2,149
$50,000 or more	63.9	83.0	93.1	79.7
s.e.	2.30	1.90	1.31	1.15
unwtd. n	498	477	508	1,483
Poverty status				
Below poverty line	33.0	53.3	88.4	58.4
s.e.	2.91	2.66	1.89	1.28
unwtd. n	384	395	405	1,184
At or above line	45.8	64.4	90.2	66.5
s.e.	1.44	1.10	0.77	0.78
unwtd. n	1,867	1,908	1,941	5,716

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Table C3— Percentage of children enrolled in kindergarten programs, by age, household income, and poverty status: 1991

	Percent 3-year-olds enrolled	Percent 4-year-olds enrolled	Percent 5-year-olds enrolled	Percent 3- to 5-year olds enrolled
Total	0.4	3.4	71.6	24.8
s.e.	0.14	0.37	1.07	0.36
unwtd. n	2251	2303	2346	6900
Household income				
$15,000 or less	—	3.0	71.2	25.3
s.e.	—	0.83	2.93	1.44
unwtd. n	391	410	410	1211
$15,001–$25,000	0.6	4.0	69.0	23.5
s.e.	0.34	0.91	2.70	1.25
unwtd. n	406	385	408	1199
$25,001–$30,000	—	4.7	71.5	26.7
s.e.	—	1.38	2.80	1.61
unwtd. n	273	283	302	858
$30,001–$50,000	0.5	3.3	72.1	23.9
s.e.	0.31	0.58	1.60	0.96
unwtd. n	683	748	718	2149
$50,001 or more	0.6	2.7	74.2	25.4
s.e.	0.37	0.69	1.99	1.22
unwtd. n	498	477	508	1483
Poverty status				
Below poverty line	—	3.2	69.9	24.9
s.e.	—	0.80	2.87	1.36
unwtd. n	384	395	405	1184
At or above line	0.5	3.4	72.2	24.7
s.e.	0.18	0.42	1.01	0.53
unwtd. n	1867	1908	1941	5716

—Too few cases for a reliable estimate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Table C4— Percentage of preschool* children enrolled in center-based programs, by age, mother's employment status, and household income: 1991

	3-year-olds		4-year-olds		5-year-olds		3- to 5-year olds	
	Non-employed mothers	Employed mothers	Non-employed mothers	Employed mothers	Non-employed mothers	Employed mothers	Non-employed mothers	Employed mothers
Total	34.3	49.3	52.5	65.5	57.8	69.0	44.9	58.8
s.e.	1.94	1.78	1.75	1.43	3.45	2.51	1.19	1.03
unwtd. n	910	1,282	850	1,310	269	351	2,029	2,943
Household income								
$15,000 or less	30.6	40.4	40.8	61.0	58.4	69.0	38.5	53.5
s.e.	3.81	4.63	3.67	3.83	8.60	8.05	2.49	2.65
unwtd. n	228	154	195	190	68	41	491	385
$15,001–$25,000	20.0	43.3	44.9	55.6	47.8	67.1	34.1	51.5
s.e.	3.36	3.93	3.97	4.55	7.48	5.77	2.73	2.89
unwtd. n	183	206	162	189	57	57	402	452
$25,001–$30,000	24.4	40.1	50.2	57.4	—	59.3	39.5	50.0
s.e.	5.35	4.73	5.09	5.21	—	8.49	3.41	3.23
unwtd. n	102	164	109	153	25	54	236	371
$30,001–$50,000	38.9	49.5	55.9	65.5	55.8	73.5	48.4	59.7
s.e.	3.51	2.76	3.06	2.08	5.59	3.61	2.44	1.61
unwtd. n	239	426	230	473	67	125	536	1,024
$50,000 or more	62.6	65.1	83.9	82.0	75.9	70.9	73.2	73.0
s.e.	4.36	3.02	2.67	2.34	6.77	5.58	2.67	1.98
unwtd. n	158	332	154	305	52	74	364	711

*"Preschool children" were defined as children ages 3–5 who were not enrolled in kindergarten.
—Too few cases for a reliable estimate.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Table C5— Number of preschool[1] children enrolled in center-based programs and percentage of those children enrolled in full-day programs, by age, household income, and mother's employment status: 1991

	3-year-olds		4-year-olds		5-year-olds		3- to 5-year-olds	
	Number of pre-schoolers enrolled	Percent enrolled in full-day program	Number of pre-schoolers enrolled	Percent enrolled in full-day program	Number of pre-schoolers enrolled	Percent enrolled in full-day program	Number of pre-schoolers enrolled	Percent enrolled in full-day program
Total	1,585,631	44.9	2,196,246	34.3	666,364	30.7	4,448,241	37.5
s.e.	54,155.2	1.89	39,336.0	1.54	30,892.6	2.67	80,617.2	1.04
unwtd. n	976	950	1,373	1,347	405	399	2,754	2,696
Household income								
$15,000 or less	329,421	42.8	461,175	42.4	175,056	32.8	965,651	40.7
s.e.	34,385.8	5.05	31,431.7	4.15	25,366.4	6.40	50,377.4	2.73
unwtd. n	129	124	199	193	67	67	395	384
$15,001–$25,000	236,153	52.9	345,286	35.0	121,954	32.1	703,393	40.5
s.e.	22,558.1	4.88	20,444.1	3.95	13,901.0	5.48	35,040.6	2.78
unwtd. n	132	131	191	189	67	67	390	387
$25,001–$30,000	126,863	47.0	208,662	29.4	67,389	33.4	402,914	35.5
s.e.	14,392.9	6.63	18,009.3	4.60	9,132.6	6.61	24,096.3	2.98
unwtd. n	94	90	150	148	49	49	293	287
$30,001–$50,000	442,936	50.6	644,455	30.9	175,202	27.7	1,262,593	37.3
s.e.	25,108.5	4.13	27,178.6	2.05	14,471.1	3.48	43,661.3	2.01
unwtd. n	307	297	453	446	128	126	888	869
$50,000 or more	450,258	36.2	536,668	33.0	126,763	29.3	1,113,690	33.9
s.e.	29,687.4	3.32	30,465.0	2.94	12,107.7	6.49	54,339.9	2.24
unwtd. n	314	308	380	371	94	90	788	769

Table C5— Number of preschool* children enrolled in center-based programs and percentage of those children enrolled in full-day programs, by age, household income, and mother's employment status: 1991—Continued

	3-year-olds		4-year-olds		5-year-olds		3-to 5-year-olds	
	Number of pre-schoolers enrolled	Percent enrolled in full-day program	Number of pre-schoolers enrolled	Percent enrolled in full-day program	Number of pre-schoolers enrolled	Percent enrolled in full-day program	Number of pre-schoolers enrolled	Percent enrolled in full-day program
Mother's employment status								
Not in labor force	482,592	16.2	639,440	12.7	240,752	12.4	1,362,785	13.9
s.e.	28,313.0	2.75	26,038.7	2.06	21,681.0	2.85	41,585.8	1.43
unwtd. n	289	274	399	387	143	140	831	801
Looking for work	69,440	26.7	119,719	33.4	—	—	221,360	31.0
s.e.	13,004.5	8.49	15,481.4	6.30	—	—	23,325.1	4.77
unwtd. n	36	36	66	65	14	14	116	115
Less than 35 hours per week	400,943	35.7	552,944	22.7	152,001	29.3	1,105,888	28.3
s.e.	30,266.0	4.36	31,814.0	2.41	14,193.9	5.33	54,000.8	2.03
unwtd. n	243	238	350	343	95	93	688	674
35 hours per week or more	608,247	73.0	821,550	58.4	224,767	48.2	1,654,563	62.3
s.e.	35,195.9	2.77	35,111.2	3.12	19,384.2	4.76	53,071.1	2.12
unwtd. n	391	385	521	515	144	143	1,056	1,043

*"Preschool children" were defined as children ages 3–5 who were not enrolled in kindergarten.

—Too few cases for a reliable estimate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

Table C6—Number of preschool* children enrolled in center-based programs nationwide and in states with standards for group size; and of those enrolled, percentage enrolled in programs meeting the NAEYC standards for group size and child/staff ratio, and the state standards for group size and child/staff ratio, by household income: 1991

	Number enrolled in center-based program	Number enrolled in states with group size standard	Percentage of children enrolled in programs that met standard of quality			
			Group size		Child/staff ratio	
			NAEYC	State of residence	NAEYC	State of residence
Total	4,448,241	2,361,514	90.8	79.2	88.5	94.8
s.e.	80,617.2	71,831.2	0.63	1.58	0.67	0.49
unwtd. n	2,754	1,502	2,754	1,440	2,599	2,575
Household income						
$15,000 or less	965,651	471,724	88.6	78.8	90.2	95.1
s.e.	50,377.4	39,151.5	1.63	3.51	1.38	1.51
unwtd. n	395	199	395	182	358	357
$15,001–$25,000	703,393	357,772	91.1	77.9	83.9	93.8
s.e.	35,040.6	24,045.1	1.21	3.42	1.96	1.55
unwtd. n	390	200	390	188	358	353
$25,001–$30,000	402,914	248,674	91.1	73.1	85.5	93.1
s.e.	24,096.3	18,213.6	2.08	4.23	2.39	1.82
unwtd. n	293	181	293	173	276	273
$30,001–$50,000	1,262,593	706,795	91.8	79.3	87.7	95.3
s.e.	43,661.3	33,913.8	1.16	2.34	1.17	0.71
unwtd. n	888	500	888	485	841	831
$50,000 or more	1,113,690	576,551	91.3	82.8	91.9	95.3
s.e.	54,339.9	30,555.4	1.32	2.11	1.36	0.70
unwtd. n	788	422	788	412	766	761

*"Preschool children" were defined as children ages 3–5 who were not enrolled in kindergarten.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1991, Early Childhood Education Component.

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